Working for Clean Water

An Information Program for Advisory Groups

Environmental Assessment

What is meant by *environment?*

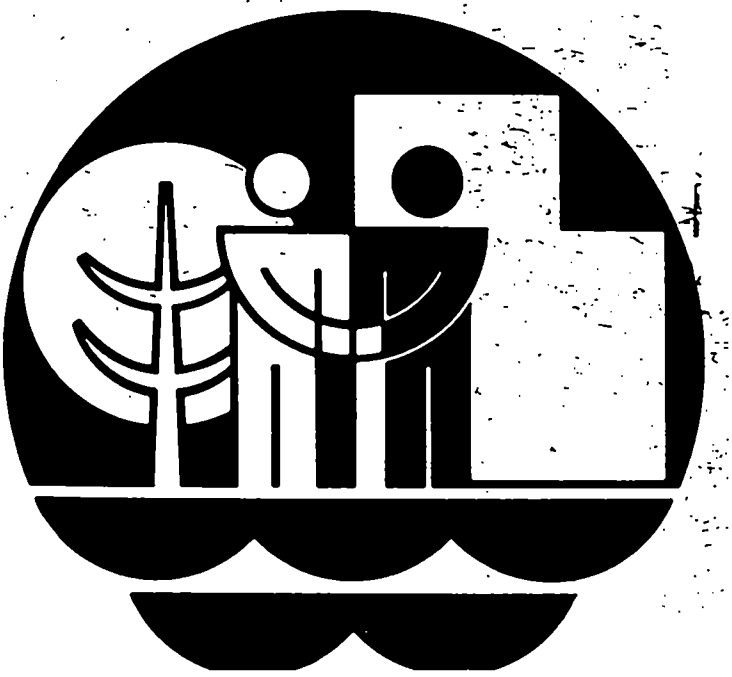
What impacts do water quality projects have upon the environment?

What are the contents of an environmental assessment?

What role does it play in planning?

How can advisory groups participate in environmental analyses?

Citizen Handbook



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Environmental Assessment

Focus on Environment

In many parts of the country, surface waters are cleaner today than they were just a decade ago. Fish are returning to once-polluted streams. Community pride in water resources is on the upswing. Although the work for clean water is far from over, things are better in many places. All this was accomplished while population grew, and pollution continued. What turned the situation around? It is mainly a matter of environmental awareness, and careful consideration of the environmental effects of plans.

What is meant by environment? How is it involved in planning? Where do citizens fit in?

Environment is a word of many meanings. For the interior decorator it means household furnishings. To urban dwellers it includes skyscrapers. For some persons it is the natural world of plants and animals. These diverse viewpoints have one thing in common—surroundings. *Environment means surroundings.* In water resource planning, environment includes natural elements such as water and wildlife, and economic and social features such as employment and housing. Meaningful water resource planning thus involves just about everything. Economic matters alone are not enough.

Including environmental considerations in water resource planning has several benefits:

- Incorporation of environmental values in decisions
- Protection of cultural, historical, and natural resources
- Broad basis for determining the costs and tradeoffs of proposed projects.

Besides, it is the law!

Regulations of the United States Environmental Protection Agency (EPA) call for the consideration of the environmental effects of certain projects and programs in water resource planning. These regulations apply to efforts such as 201 local facilities plans, and 208 water quality management plans (The numbers refer to sections of the Clean Water Act).

Facility Planning

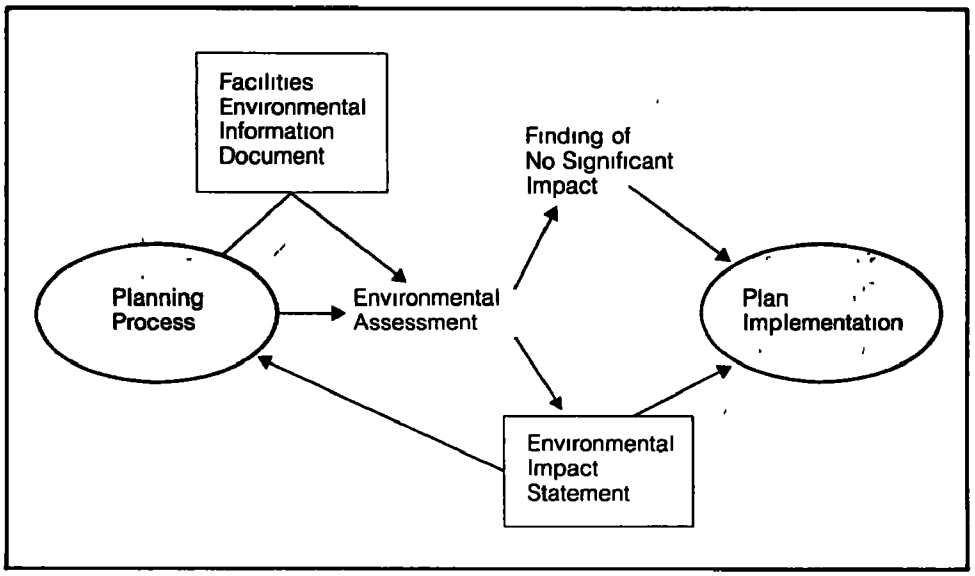
In planning local wastewater management facilities, an *environmental information document* describing the environmental effects of proposed actions is prepared by the grantee or similar agency. The EPA then evaluates this information for environmental impacts, and ways of avoiding or minimizing the adverse effects of the actions. The resulting public document, called an *environmental assessment,* provides data and analyses on the significance of the environmental impacts. If no significant adverse impacts are anticipated, the EPA issues a *Finding of No Significant Impact.* However, if significant impacts are possible, and they cannot be sufficiently reduced or eliminated, an *environmental impact statement* is prepared and released. The impact statement is a report which identifies and analyzes in detail the environmental impacts of proposed actions and feasible alternatives. The statement differs from the environmental assessment in the level of detail and in the scope of analysis; it is more comprehensive than an environmental assessment, and concentrates upon areas with potential for significant environmental degradation. Impact statements are prepared when the wastewater facilities will induce significant changes in land uses, will seriously impair air or water quality, or will adversely affect other resources.

An overwhelming majority of the assessments report no significant adverse impacts. Fewer than ten percent of the facility plans result in impact statements. Increasingly, however, the EPA and/or the public have been challenging the environmental findings because of inadequate analysis, or the insufficient documentation of community needs. These controversies can delay facility planning for a year or more. In several regions such as New England, some impact statements are prepared concurrently with the facility plans. While the impact statement must be complete before the facility plan can be approved, this "piggybacking" approach can avoid the delay inherent in doing the two separately.

Water Quality Management Planning

In water quality management (WQM) planning, environmental information also is used in shaping alternatives. However, a separate report such as the environmental information document is not prepared during or after the WQM plan is completed. The environmental information is included with the plan itself. The final form of this data is determined by the state or areawide planning agency, and the EPA regional office.

After the plan is submitted, the EPA reviews the environmental findings to determine whether an impact statement is necessary. If a significant adverse environmental impact is likely to occur, a draft statement is prepared by the EPA, and is distributed to interested or affected groups. After these recipients have had time to comment, a final statement is prepared incorporating their comments. State and areawide water quality management plans seldom need environmental impact statements.



Elements of Environmental Assessment

Although the environmental information of WQM and facility plans may be reported differently, the contents are essentially th same. Together with a list of information sources, the environmental information includes:

- Description of current and future environment, without the implementation of a plan
- Evaluation of alternative plans
- Discussion of environmental consequences
- Description of measures to mitigate or minimize adverse effects.

These aspects, in general, apply to both WQM and facilities planning.

Description of Current Environment

Knowledge of the existing environment is important for identifying water quality problems and for comparing alternative plans. In describing the current situation, analysts look at natural resources such as water quality, cultural features such as population, and environmentally-sensitive areas such as wetlands. However, this is not just a straightforward data-gathering exercise. Environmental information missed or misinterpreted may substantially affect the planning outcome.

Advisory groups can monitor the current situation by seeking answers to questions such as:

- **Have the environmental aspects of existing water quality problems, from both point and nonpoint sources, beer sufficiently and accurately identified?**
- **Are existing population and land use data properly assessed?**
- **Have all environmentally-sensitive areas been identified?**
- **Are the boundaries and criteria of the analysis realistic?**
- **Do the methods of data collection make sense?**

A basic concern is the accuracy and scope of the data. Careful attention to study boundaries and assessment criteria can minimize these difficulties.

Study Boundaries

Boundaries refer both to the geographical area, and the type and degree of topics that make up the studies. The geographical area must be large enough to assess all potential environmental impacts of any wastewater treatment alternatives or water quality management plans. It must, for example, include the entire area that might receive growth induced by water projects. Similarly, it must be large enough so that cost-effective alternatives can be considered. Since boundary selection often crosses town borders, especially in WQM planning, political and legal tugs-of-war may occur among communities. This conflict can be held to a minimum by the selection of advisory group members who represent the relevant interests of participating communities.

Another type of planning boundary is the subject matter or scope of studies. Although the EPA regulations call for certain analyses such as population projections, other factors not explicitly named should be studied. For example, in some areas the ethnic composition and location of the residents may be just as important as overall population size.

Since the advisory group is especially sensitive to local concerns and values, its perspectives can be invaluable in setting the course of these planning studies.

Assessment Criteria

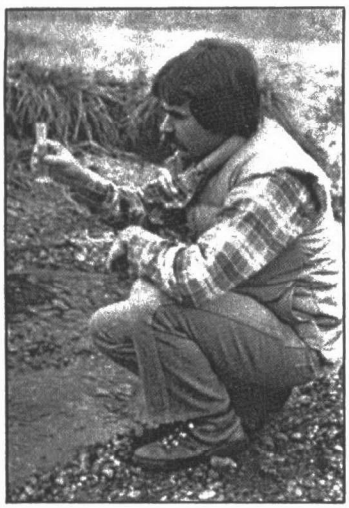
Criteria, the guidelines for making decisions, need explicit attention in environmental studies. The use of *appropriate* criteria throughout the planning process — from data collection to plan selection — is extremely important. Some criteria, such as those for cost-effectiveness analysis, are given in the regulations. However, others such as those for data collection are not drawn out. Sometimes, in a rush to get the work done, poor data measures are adopted and/or the reasons for their selection are not given. A remedy for this situation is having measures that fit the subjects. For example, quantitative measures are often inappropriate for assessing aesthetics. Yet, some analysts compare all factors, including aesthetics, on a numerical basis.

It is neither the role nor the function of advisory groups to make such analyses. This work is best left to the consultants and planning staff. However, advisory groups have a responsibility to know how data is being collected, analyzed, and interpreted. They should be told why certain assessment approaches were chosen, why others were ruled out, and what ramifications these choices have for the community. Since all planning is based upon data, advisory groups must see that the methods of data collection make sense.

Description of Future Environment

Many WQM and facility plans propose reasonable solutions to managing water quality and disposing of wastewater. However, some plans have resulted in economically and socially burdensome projects. A major shortcoming has been the identification of water quality and wastewater management needs, especially future needs. This aspect of environmental analysis, the determination of the future situation both with and without plans, is a weakness of the assessment process.

Compared to the effort spent compiling an inventory of the present situation, too little attention is often given to future conditions. Projection methods may be inadequate. For example, an environmental assessment of a proposed wastewater project in central Pennsylvania stated that sewer construction alongside a trout stream would result in sedimentation. No estimates were given of the amount of sedimentation or its effects on fish, water quality, and aquatic productivity. In this instance, the description of the future environment was clearly inadequate. However, the extent of these studies depends, in part, upon the anticipated impacts and their value to the community. Every aspect cannot be studied to the last degree. Just as decisions must be made on the scope of studies, similar decisions must be reached on the extent of the assessments.



Testing water quality.

Advisory groups, sensitive to community concerns, can help decision makers make judgments about the resources that are committed to an environmental assessment. Factors that are complex or important usually will need more effort spent on the assessment. One factor in water quality planning that is particularly significant is the size of the future population.

Population Estimates

Most water quality difficulties are caused by human actions. Many problems such as urban runoff and wastewater production are often in direct proportion to the number of people. Therefore, accurate population estimates are essential in assessing the future situation.

To avoid unneeded wastewater treatment capacity, or construction that induces undesired growth, the EPA has guidelines for making population estimates. The EPA requires that population estimates for each facility planning area be consistent with the national and state estimates. The state water quality agency, working with WQM planning agencies or other regional agencies, will break down the state population estimates into regional projections. Numerous facility plans may fit into these projections.

Maine. A 208 water quality analysis and population projection identified eutrophication from phosphorus enrichment as a potential threat to Lake Maranacook, which borders Readfield. Agriculture, failing septic systems, and stormwater runoff were found to be the sources of this nonpoint source pollution.

Various analysis approaches at the local level may be used, including extrapolations of past growth trends, estimations according to population age groups, and even forecasts based upon business activities. However, the approach that is adopted must make sense. Its results must be consistent with the overall estimates for the state and water quality planning area. Any deviance from these projections, as might occur from an unanticipated influx of immigrants, must be thoroughly justified by the planning agency.

A few questions appropriate for describing the future environment include:

- **Can current and past trends be expected to continue into the future?**
- **Are the projections of population, stormwater runoff, and similar considerations realistic?**
- **Are any potentially significant factors excluded from the assessment?**
- **Have sufficient resources been allocated for studying important issues?**

These descriptions of current and future environments provide a basis for evaluating water quality and wastewater management alternatives.

Evaluation of Alternatives

The environmental assessment is used for comparing alternatives, and selecting the final plan. An array of possibilities is usually considered. Alternatives are screened based upon monetary costs, environmental effects, and physical, legal or institutional constraints. Alternative actions include: structural approaches such as wastewater treatment plants, and sediment basins for stormwater runoff; nonstructural measures such as land use ordinances, and changed operation and management for improved wastewater treatment efficiency. In fact, the EPA regulations for facility planning call for analyses involving:

- Flow and waste reduction measures through water conservation and control of infiltration/inflow
- Alternative locations, capacities, and phasing of facilities construction
- Alternative waste treatment and sludge management techniques
- Improved operation and management efficiency
- Energy reduction
- Multiple use of treatment facilities for activities such as education and recreation

A wide range of alternatives is also considered in WQM planning. A major thrust of the WQM program is the

development of Best Management Practices for preventing or abating pollution from nonpoint sources. Methods such as street sweeping and sediment detention basins are being studied at dozens of test sites around the country. These results should be available by the end of 1983, or sooner.

In focusing upon the benefits, drawbacks, and risks of each alternative, it is easy to lose sight of broad relationships and cumulative, long-term effects. Similarly, the tradeoffs between short-term gains and long-term losses should be explored. For example, disruptions during a construction project should be compared with the probable impacts of induced growth and community development. The extent to which a proposed plan would foreclose future options should be discussed.

Pennsylvania. The potential loss of wilderness near Philadelphia due to a proposed interceptor project was worth $9 million. The foregone benefits made a competing spray irrigation alternative much more cost effective.

The evaluation of alternatives shows that different kinds of impacts occur at various points in time.

Discussion of Environmental Consequences

The environmental assessment of a WQM or facility plan involves many facets. Although the required content of the assessment is given in EPA regulations, the relative emphasis placed upon different elements varies from place to place, and changes from time to time. These impacts occur in different ways.

Primary Impacts

Effects directly related to the location, construction, and operation of projects or programs are considered *primary* impacts. They can be either beneficial (positive) or adverse (negative). At the local level, primary beneficial impacts include the removal of disease-causing organisms from wastewater, and the reclamation of poor soils by application of sludge. Negative impacts may include the noise and soil erosion which occur during sewer excavation. Impacts of WQM efforts may be less obvious, but are still important. Destruction of open space, loss of wildlife habitats, and the transfer of wastes out of an area can be problems of regional significance. Beneficial primary impacts of WQM plans include reduced costs through shared facilities, and expanded multiple use opportunities.

Direct impacts are interrelated. If environmental disruption is to be held to a minimum, or costs are to be kept low, a water quality project often should be built within or adjacent to a developed area. However, the aesthetics will suffer because of the siting: unsightly construction, noise, and traffic disruption as a treatment plant is built; other problems such as odors may exist after construction is completed.

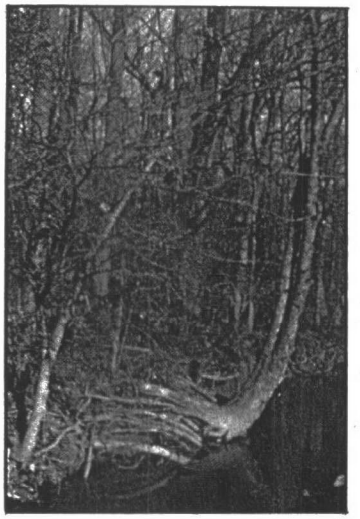
California. Planners in Monterey faced an impacts tradeoff. The only available sites for a wastewater treatment plant were on prime farmland — a principal source of artichokes for the nation. In the end, agriculture was forced to move to less desirable land.

The primary impact is important, but another kind of impact may be even more significant, especially for WQM plans.

Secondary Impacts

Indirect effects that are induced by a program or project are called *secondary* impacts. They involve the subtle, often long-term, changes in location, density, timing, and type of development brought about by the construction of treatment facilities. Impacts on population, economic growth, land use, and the environment are the main areas of concern. For example, in many areas the siting of sewers and treatment plants directly influences the location of growth within a region.

Secondary environmental impacts from growth and sprawl are numerous. New suburbs, shopping centers, industrial parks, and recreation centers may consume excessive energy, and generate air pollution from traffic. Newly built-up areas also contribute to stormwater runoff and nonpoint source pollution. Facilities may induce unwanted urban development that infringes on open space, recreational areas,



Eroding stream bank.

historical sites, or agricultural lands. The scenic character or ethnic makeup of an area can be disrupted by the forces of growth. For example, sewering usually permits dense development such as high-rises and townhouses. The type and quantity of housing in an area, as well as the people who can afford it, may change as an indirect result of treatment facilities.

Some secondary impacts are singled out for special attention by federal law. They include construction in wetlands, destruction of habitats for endangered species, development in flood-prone areas, and degraded air quality in certain geographical areas. Other impacts such as steep slopes may be of special concern to states or communities.

In evaluating the alternatives, and describing their environmental consequences, several questions are appropriate:

- **Is a full range of realistic alternatives — both structural and nonstructural types — evaluated?**
- **Are the alternatives consistent with the values of the community?**
- **Does the evaluation consider short-run and long-term tradeoffs, and irreversible commitments of resources?**
- **Are all potentially significant impacts — both primary and secondary — included in the analysis?**

Mitigation of Impacts

An appropriate followup to assessing impacts is studying ways to mitigate (remedy) the adverse effects of alternative plans. In fact, the consideration of mitigating measures is required under the EPA regulations.

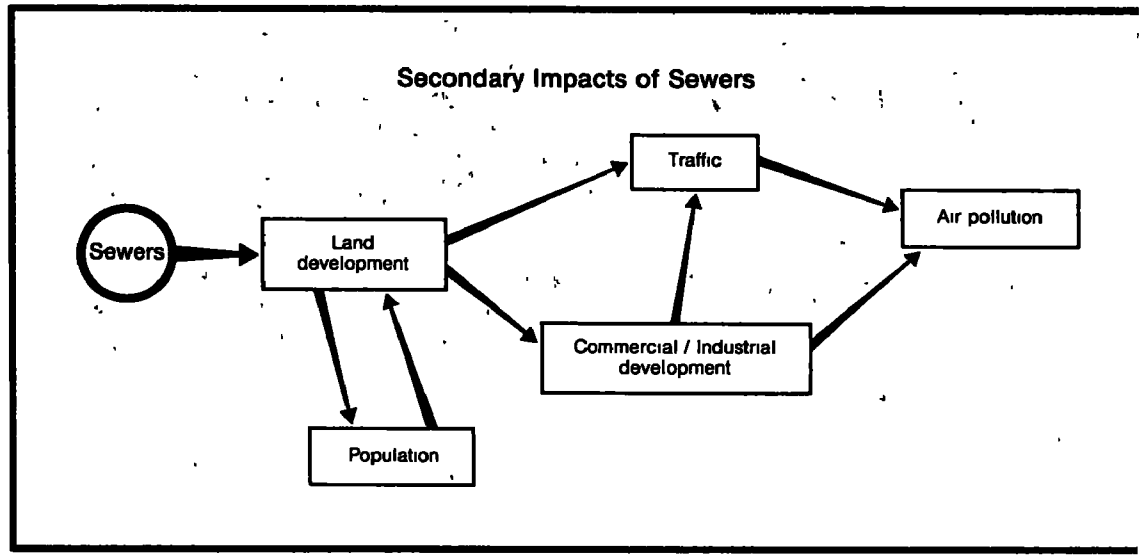
Most primary or secondary impacts are mitigated by several measures. Yet, both the measures and the local situations vary It is important to select the measure that best meets the needs of a particular area of the community.

Several questions should be considered in selecting mitigation methods:

- **What mitigation techniques are available?**
- **How feasible are these measures?**
- **Who will be responsible for their implementation and enforcement?**

Technique Availability

Primary impacts such as erosion, sedimentation, and noise are generally short-term impacts. They are relatively easy to mitigate through site planning, control of construction activities, and facility operations or program management.



These problems can be kept to a minimum, in part, through thoughtful site selection and working with, rather than against, environmental constraints such as limited terrain. An example of mitigative site planning is the use of vegetation as a visual screen, or as a buffer against nonpoint source pollution. Another strategy is the control of construction impacts through measures such as restoring disturbed soils immediately, and continually cleaning up debris. An additional approach involves proper operating procedures, such as adequate treatment and disposal of sludge to minimize odors.

Wisconsin. The Dane County Regional Planning Commission, through its WQM program and the local Soil and Water Conservation District, developed an effective agricultural nonpoint source control program. Using cost sharing, techniques such as minimum tillage and stream bank fencing were emphasized.

Secondary impacts can have long-term consequences that often are difficult to predict and correct. Efforts to control them are relatively recent. The EPA has identified a range of possibilities for dealing with secondary impacts. The list includes: project changes such as a reduction in treatment plant capacity; land use regulations such as zoning and subdivision ordinances to protect water quality; restrictions on the number and type of sewer hook-ups. A more controversial approach for mitigating adverse impacts involves multiple use activities, such as wastewater treatment facilities used for recreational purposes.

Adoption Feasibility

Identifying possible techniques is only the initial step. Just as important is the feasibility of implementing a particular mitigation measure. Especially difficult are adverse secondary impacts that are not easily mitigated through technological fixes. Land use controls such as zoning and floodplain ordinances are usually needed.

Communities concerned with stimulating economic development may be unresponsive to land use controls. Even the local land use plans may be inadequate for particular mitigation measures. Therefore, plans and enforcement should be reviewed carefully to determine their effectiveness and feasibility for various mitigation measures. Two other important factors are monetary cost and timing.

A major consideration is the cost to the *community* of implementing a technique. Some measures, such as the reduction of a service area, may actually bring down project costs. Others, such as using existing trees for screening, may have no effect on cost. For the community, grant-eligible expenditures are as important as the total costs. Some mitigating actions, such as extending an outfall an extra 100 yards, may make the item grant eligible. Measures that are considered innovative or alternative technologies can reduce the local share of design and construction costs by forty percent! However, some mitigating costs, such as acquiring wetlands to discourage future development, may not be eligible for federal grants.

Timing is also a key element in implementation. Mitigation measures should be considered early in the planning process, soon after impacts are identified. Once the engineering designs are completed, or construction is underway, it may be extremely difficult to make changes.

Implementation and Enforcement Responsibility

An equally important matter is who will have the responsibility for implementing mitigation measures. The planning agency must have the capacity to coordinate the efforts of the many organizations and individuals that are involved. For example, the facility contractor may build erosion and sediment control structures such as detention basins. However, an official usually conducts an inspection. The planning agency itself may be responsible for ongoing maintenance. The local government generally has the responsibility of implementing land use controls.

California. A facilities plan for North Monterey called for the mitigation of construction, operation, and growth-related impacts. Over 16 agencies and organizations were identified for possible implementation roles.

In facilities planning, the grant recipient must demonstrate that it has the necessary legal, institutional, financial, and managerial resources to carry out construction, operation, and management — and mitigation of primary and secondary impacts. However, areawide and regional arrangements may be troublesome. One community or organization may be planning on the behalf of several others. Since several jurisdictions are involved, no single local organization may have the authority to implement mitigation measures outside its own area. Or, it may be a special agency with powers too limited to carry out mitigation projects. Therefore, this situation may require an interjurisdictional authority with powers for implementing mitigation measures. Although the local agency executes the mitigating actions, the EPA has the ultimate responsibility to make sure that appropriate measures are adopted. This is done by monitoring the planning process.

Environmental Assessment in the Planning Process

All planning, even water quality planning, has similar events. They include:

- Identifying problems
- Establishing goals and objectives
- Compiling data
- Developing and evaluating alternatives
- Selecting a plan
- Implementing and revising the plan.

WQM and facilities planning differ primarily in subject scope, level of detail, and regulatory requirements.

Advisory Group Activities

Environmental inputs are dealt with throughout the planning process. In facili planning, perhaps even before the advisor group is formed, it is important to discuss potential impacts at the preapplication conference. Activity at this point shows local interest, and starts planners thinkir about impacts and mitigation measures.

Early in the planning process, goals are established and data is collected. Advisor groups can address these concerns by putting environmental issues on meeting agendas. Advisory groups can consult wit their constituents, and communicate the values and opinions of the public to the planners. Frequent news releases about environmental aspects can interest the community in water projects, and establish on-going support. Fact sheets about programs or projects can be released to th public at the beginning of the process. These sheets can be used to point out environmental issues.

Advisory groups can be actively involved in developing and evaluating alternatives. Subcommittees can be formed to study various aspects, especially from the perspective of the local interests. Resource specialists such as soil conservationists ca be invited to contribute their expertise to advisory group discussions. In facilities planning, the grantee is required to help identify these parties. This is also a time for assessing mitigation measures. Advisory group members and the public can take tours of existing facilities to observe mitigation techniques in operatio

Informational meetings are especially appropriate for the plan selection, and the needs assessment early in the process. They present an opportunity to make environmental tradeoffs known to the public, and to hold planners accountable for their analyses.

Advisory group members should encourage planners to present data and findings in ways that are relevant to the audience. Charts and pie graphs may appeal to the general public, while tables of data are more appropriate for technicians. Accoun sheets may be an effective way for displaying environmental, economic, and social impacts. Similarly, reports can be written with different levels of detail or

summarized for communication with all interests in the community. Tradeoffs should be explained in common terms, such as the effect of the project on the local tax rate, or the project compared with other expenditures such as a new school. It must be made easy for people to compare proposals and tradeoffs.

The review of final plans and specifications offer additional opportunities for the consideration of environmental issues. In facilities planning, impact mitigation can be made a condition for design and construction grants.

Texas. The North Central Texas Council of Governments in the Dallas-Fort Worth area is incorporating water quality into comprehensive planning and development for the region. It consolidates input from several technical committees into a Preferred Regional Development Program. This program integrates five areas: transportation, sewage, water supply, housing, and land use.

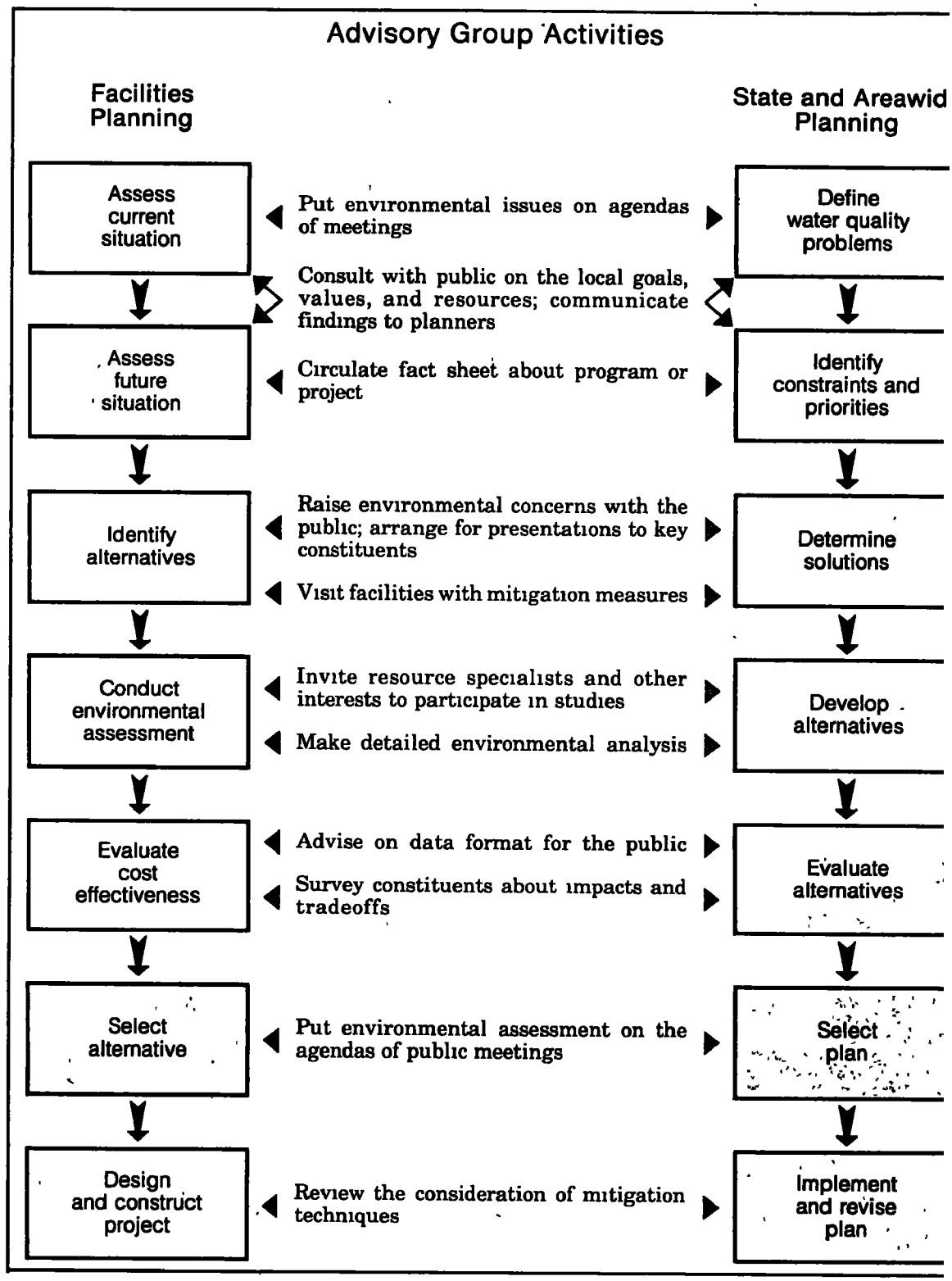
Place in the Planning Process

Some persons think that the environmental assessment should be limited to the latter part of the planning process, and handled as a task apart from other planning functions. This can result in plans that overlook environmental issues, and cause subsequent implementation problems. The EPA inadvertently encourages this practice, requiring the submission of the environmental information document separate from the facilities plan.

Proper water quality planning is a back-and-forth process. The assessment of current and future situations goes into the development of alternative plans. The evaluation of these alternatives, in turn, often leads to further studies of the future, and so on. Similarly, the environmental assessment proceeds concurrently with all steps in the planning process.

Environmental Factors in Planning

Natural features	Cultural factors	Sensitive areas
Surface and groundwater quality	Population	Endangered species
Hydrology and water supply	Housing	Flood plains
Air quality	Employment	Wetlands
Soils and topography	Transportation	Coastal zones
Plant and animal communities	Land use	Wild and scenic rivers
Noise and odors	Historical sites	Agricultural areas
Solid wastes	Recreation and open space	Earthquake zones
Energy resources	Aesthetics	Steep slopes


Advisory Group Activities
Facilities Planning
State and Areawid Planning
Assess current situation
Assess future situation
Identify alternatives
Conduct environmental assessment
Evaluate cost effectiveness
Select alternative
Design and construct project
Define water quality problems
Identify constraints and priorities
Determine solutions
Develop alternatives
Evaluate alternatives
Select plan
Implement and revise plan
Put environmental issues on agendas of meetings
Consult with public on the local goals, values, and resources; communicate findings to planners
Circulate fact sheet about program or project
Raise environmental concerns with the public; arrange for presentations to key constituents
Visit facilities with mitigation measures
Invite resource specialists and other interests to participate in studies
Make detailed environmental analysis
Advise on data format for the public
Survey constituents about impacts and tradeoffs
Put environmental assessment on the agendas of public meetings
Review the consideration of mitigation techniques

Main Points

Because environment means surroundings, the word has different connotations for various persons. To the EPA it means just about everything. Environmental assessments in water quality planning, therefore, evaluate jobs, housing, and aesthetics, as well as water quality, animals, and other natural resources. In water quality planning, environmental factors are as important as monetary costs.

Environmental information documents are prepared for all facilities plans. Impact statements are done only if projects are controversial, are expected to have significant impacts, or other circumstances warrant additional studies. Water Quality Management planning is also subject to the environmental assessment process, but WQM plans seldom need an impact statement.

Programs have different regulations, and different terms describe the assessment steps. However, the environmental assessment involves the same basic elements: description of current and future environments; evaluation of alternative plans; discussion of environmental consequences; description of measures to mitigate or minimize adverse effects.

Impacts can be either beneficial (positive) or harmful (negative). They also are classified as either primary or secondary, terms which do not reflect their importance, but show their relationships to actions. Primary impacts are due directly to a project or program. Secondary effects, such as growth, are induced or caused indirectly by a project.

Successful projects require the mitigation of adverse impacts. The choice of mitigation measures depends upon technique availability, implementation feasibility, and enforcement responsibility. Secondary impacts are generally more difficult to mitigate.

WQM and facilities planning programs have different specific requirements, but they have the same basic planning elements. Both involve: identifying problems; establishing goals and objectives; compiling data; developing and evaluating alternatives; selecting a plan; implementing and revising the plan.

Advisory groups can ensure that environmental aspects are considered throughout the planning process. Meetings, public hearings, fact sheets, project reviews, and other occasions are opportunities for citizen involvement. Maximum information exchange between the planners and the public requires different kinds of communication approaches for the diverse public and discussions in common terms.

Environmental assessment plays a key role in soil conservation planning.

Case Study

Mitigating Growth Impacts and Protecting Wetlands

Block Island, Rhode Island

Adapted from Municipal Wastewater Management· Citizen's Guide to Facility Planning, *by Clem L Rastatter, editor. Washington, DC· U.S Environmental Protection Agency, Office of Water Program Operations, January 1979*

Block Island is a small island located roughly ten miles off the coast of Rhode Island. It supports a small year-round population of about 500 residents. During the summer, the resident population increases to 1,700, and on a typical summer day another 1,000 - 2,000 tourists may be visiting the island.

Development on the island has been concentrated in the Old Harbor area. Hotels, inns, rooming houses, restaurants, and shops are clustered along the old harborfront. To the northwest, more recent development has taken place in the New Harbor area. The remainder of the island is largely open heath, pasture, numerous ponds, and inland wetlands. Of the island's nearly 7,000 acres, over 5,000 are in heath and open pasture, and another 1,000 acres are in water and wetland.

In 1972, the island adopted a comprehensive development plan. The goals and policies outlined in the plan include protecting environmentally sensitive lands and natural areas, preserving the rural New England character of the island, and confining development to lands with soils suitable for septic tanks. In 1973, the township updated its 1967 zoning ordinance to conform with the new plan, and to ensure the protection of wetlands, ponds, and streams.

The Problem

Until the late 1960's, the primary wastewater disposal method on the island was onsite sewage systems, usually with the direct discharge of raw wastewater into the ocean. In the early 1970's, a ban on raw ocean discharge caused a switch to subsurface disposal.

The high density in the Old and New Harbor areas, however, did not allow enough land for adequate subsurface disposal, particularly during the peak summer season. New construction, which was increasing at the time, placed additional strain on the capacity of the soils. As a result, many onsite systems failed, creating a situation that was aesthetically displeasing to the residents. It also represented a potential community health hazard.

Proposed Solution

Because of the serious sewage disposal problems, island officials hired a consulting engineering firm to study the situation, and develop tentative plans for a municipal collection and treatment system. Next, the township began application proceedings for federal aid. It then contracted with the same engineering firm to design, supervise construction, and start operation of the recommended waste disposal system.

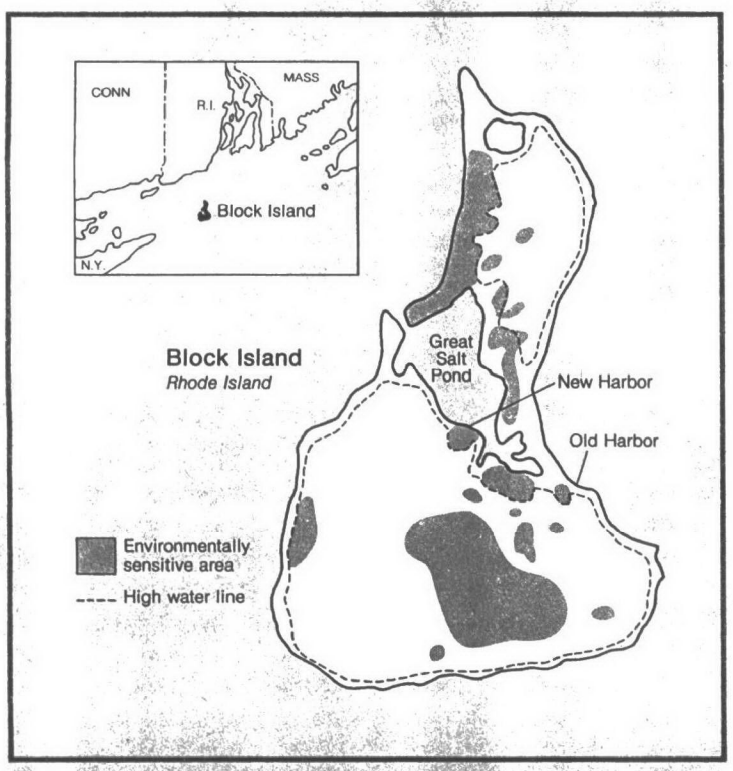
The initial plan called for the construction of a secondary wastewater treatment plant, sewers, and an outfall off th breakwater near Old Harbor. The system (0.28 mgd) was designed to initially serve both the Old and New Harbor areas, with provisions to serve the area south of Old Harbor in the future.

Based on the environmental assessment, the EPA issued Finding of No Significant Impact. However, in six months the project had become the subject of serious public controversy. Citizens discovered that the project would cost $2.6 million more than was originally estimated. It would also have serious growth implications for their community. The EPA Regional Office, recognizing the serious nature of the community concerns, reversed its decision and decided to prepare an environmental impact statement.

Issues Raised

Both the draft and final environmental impact statement discussed in some detail the project's possible secondary land use impacts. Based on the experience of other island resort communites, and depending on the demand for zoning changes and expanded treatment capacity, the statement warned that the following secondary impacts could result:

- Develop resorts and residences on wetlands, shorelines, and flood-prone areas
- Facilitate condominium and high-density residential development on the extensive open moors
- Intrude upon the character of open space, especially the view of Great Salt Pond and Block Island Sound



- Degrade water quality through runoff from additional paved and impermeable surfaces, through erosion and sedimentation associated with construction activities, and through solid waste-septage disposal and septic systems
- Increase noise levels through additional vehicles, lawnmowers, and human activities
- Degrade air quality through additional motor vehicles and power boats
- Disturb the fragile ecosystems of marshes, dunes, and upland plant and animal associations.

The Alternatives

The proposed project alternatives were carefully analyzed to ensure that an extreme growth situation would not occur, and that the severe secondary impacts would be avoided. The analysis concentrated on what were considered the four most practical choices.

Alternative A. Construction of a treatment facility and collection system to serve the Old and New Harbor sections of the island, with provisions to serve the area south of Old Harbor in the future

Alternative B. Construction of the project without provisions for sewering the area south of Old Harbor in the future

Alternative C. No sewer construction, but a comprehensive program for rehabilitating individual septic systems

Alternative D. Construction of a treatment facility and collection system for the Old Harbor area only, with rehabilitation of individual septic systems in the New Harbor area.

The draft impact statement recommended against allowing the situation to remain unchanged (a "do nothing" alternative), and against trying to solve the problem simply by upgrading existing individual septic systems (Alternative C). Also rejected was the original proposal (Alternative A), which was about to be enacted when the citizens raised their protests. This alternative was eliminated because wetlands and other environmentally-sensitive areas made up a large portion of the area proposed for future sewers. The draft impact statement recommended alternatives B and D.

Of these two recommended alternatives, the draft statement favored Alternative D. Pressures for induced growth would be minimized, particularly along the strip between the two harbors. However, due to the insistence by the Rhode Island Department of Health that septic systems could not be made adequate in the New Harbor area, the final environmental impact statement recommended Alternative B. It also advocated that both commercial areas be served by public sewers, rather than the Old Harbor area alone.

Mitigation Measures

Scaling down the original project design was the first mitigating measure. Eliminating Alternative A reduced the size of the service area. This meant that the project would not induce growth on wetlands and other environmentally-sensitive lands south of Old Harbor.

The second mitigating measure involved a specific directive to protect wetlands on the periphery of the two harbors, and lands adjacent to interceptors carrying wastes from the New Harbor to the treatment plant in Old Harbor.

The EPA attached a condition to the facilities grant. It required the grant recipient to protect wetlands by partially controlling the new growth through hook-up limitations.

It is important to note that this condition reaffirms Rho Island law on the protection of wetlands, and that it supports policies contained in the local comprehensive plan and zoning ordinance.

Need More Information?

Environmental Assessment of Construction Grant Projects. FRD-5. EPA-430/9-79-007. Washington, DC: U.S. Environmental Protection Agency, January 1979. 58 pp.

This manual is designed to aid grantees in the preparation of environmental assessments for wastewater treatment facilities. Using a checklist format, it discusses the types of environmental factors which should be considered in environmental assessment. It has four chapters which deal with procedures for identifying and assessing impacts, types of pertinent man-made and natural features, hazardous or sensitive areas, and conservation of natural resources. Federal laws and regulations are mentioned, and the minimum and supplemental requirements of the assessments are given. Copies are available from: General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, Denver, CO 80225. Give the FRD number and the publication title when ordering.

Environmental Assessment of Water Quality Management Plans. Washington, DC: U.S. Environmental Protection Agency, January 1977. 108 pp.

This report is designed to assist managers and staff of planning agencies in assessing environmental impacts of water quality management plans. In addition to an overview, chapters are devoted to land use, air quality, water quality, visual quality, and ecological economic, and social impacts. These chapters discuss parameters appropriate to the topic, baseline development, and assessment methods. Key questions about each topic also are featured. Copies may be obtained from the U.S. Environmental Protection Agency, Library Services, Mail Drop No. 35, Research Triangle Park, NC 27771. When ordering, give PDS No. 3471.

Leffel, R. Ernest, *Direct Environmental Factors at Municipal Wastewater Treatment Works.* EPA-430/9-76-003. MCD-20. Washington, DC: U.S. Environmental Protection Agency, January 1976, 104 pp.

This report is primarily limited to a few categories of impacts at municipal wastewater treatment facilities, but it does contain a good summary of evaluation and control measures of environmentally-sound projects. It has a comprehensive section on facility planning and site design. Other chapters discuss airborne pollutants, noise, and site problems. To order this publication write: General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, Denver, CO 80225. Indicate the MCD number and the title of publication when ordering.

Rastatter, Clem L., ed. *Municipal Wastewater Management: Citizen's Guide to Facility Planning.* FRD-6. Washington, DC: U.S. Environmental Protection Agency, Office of Water Program Operations, January 1979. 263 pp.

This handbook is designed to acquaint citizen leaders with important decisions that need to be made in managing wastewater. The book: identifies key decisions throughout the planning process that are critical to the facility plan and the community; identifies environmental, economic, and social considerations affecting these decisions; facilitates citizen input and helps citizens understand the legal tools to facilitate their involvement. Regarding environmental assessment, the book focuses upon primary and secondary impacts, and mitigation measures. It is available from the General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, Denver, CO 80225. Indicate the FRD number and title of publication when ordering.

Glossary

Account Sheet — a table for displaying impact assessment data to facilitate the comparison of alternatives.

Alternative Technology — wastewater treatment approach, as defined by the EPA, that can save energy or cost compared to conventional treatment methods.

Aquifer — underground bed or layer of earth, gravel, or porous stone that serves as a reservoir for groundwater.

Best Management Practice — method determined to effectively abate or prevent pollution at the overall least monetary and nonmonetary cost.

Boundary — geographical area or the degree of study.

Cost-Effectiveness Analysis — determination of whether a project or practice is worth funding; involves both monetary and nonmonetary factors.

Criteria — guidelines for making decisions

Ecosystem — the interaction of organisms with their environment.

Effluent — treated or untreated waste material discharged into the environment

Environment — surroundings, including all living and non-living factors.

Environmental Assessment — a document prepared by the EPA on its assessment of the impacts of proposed projects.

Environmental Impact Statement — document evaluating the effects of proposed projects; more comprehensive than an environmental assessment, and concentrates upon areas with potential for significant environmental degradation.

Environmental Information Document — report done by the grantee describing the environmental effects of proposed wastewater projects.

Environmental Review — the process by which the EPA identifies and evaluates impacts upon the environment.

Eutrophication — nutrient enrichment of a waterway leading to a proliferation of algae, which may result in choked lake bottoms and shorelines, decaying vegetation, dissolved oxygen depletion, and fish kills.

Erosion — the wearing away of land surface by wind or water.

Facilities (201) Planning — planning local wastewater collection, treatment, and disposal facilities; the number refers to section of the Clean Water Act.

Floodplain — a nearly flat area along the course of a stream that is subject to flooding at high water periods

Innovative Technology — new ideas and methods that can significantly reduce resource costs, improve control of toxic materials, improve operational reliability, or result in other significant public benefits.

Mitigation Measure — technique for correcting or minimizing adverse environmental impacts.

Multiple Use — wastewater treatment facilities used for functions other than pollution control, such as recreation and environmental education

Nonpoint Source — origin of pollution coming from a dispersed area; origin is generally difficult to locate.

Nonstructural Method — non-physical pollution abatement technique; includes land use controls such as zoning ordinances, construction schedules, and no-till agricultural practices.

Point Source — easily identifiable location c pollution.

Primary Impact — effect directly related to program or a project such as noise associated with the construction of a wastewater treatment plant.

Secondary Impact — effect indirectly cause by a program or project, such as community growth induced by wastewater treatment facilities.

Sediment Detention Basin — structural facility for temporarily storing stormwater runoff, during which time sediment is removed by settling.

Sewer Interceptor — pipe which carries flo from the collector sewers in the drainage basi.. to the point of treatment or disposal of the wastewater

Sludge — concentration of solids removed fr sewage during wastewater treatment.

Structural Method — techniques involving construction of physical entities for delaying, blocking, or trapping pollutants.

WQM (208) Planning — water quality management planning for a state or region; guidance for individual 201 facilities plans within the area; the number refers to section o the Clean Water Act.

Wetlands — low-lying lands which frequentl have standing water on them, such as swamp., marshes, and meadows.

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Working for Clean Water is a program designed to help advisory groups improve decision making in water quality planning. It aims at helping people focus on essential issues and questions by providing trained instructors and materials suitable for persons with non-technical backgrounds. These materials include a *citizen handbook* on important principles and considerations about topics in water quality planning, an *audiovisual presentation*, and an *instructor guide* for elaborating points, providing additional information, and engaging in problem-solving exercises.

This program consists of 18 informational units on various aspects of water quality planning:

- Role of Advisory Groups
- Public Participation
- Nonpoint Source Pollution: Agriculture, Forestry, and Mining
- Urban Stormwater Runoff
- Groundwater Contamination
- Facility Planning in the Construction Grants Program
- Municipal Wastewater Processes: Overview
- Municipal Wastewater Processes: Details
- Small Systems
- Innovative and Alternative Technologies
- Industrial Pretreatment
- Land Treatment
- Water Conservation and Reuse
- Multiple Use
- Environmental Assessment
- Cost-Effectiveness Analysis
- Wastewater Facilities Operation and Management
- Financial Management

The units are not designed to make technical experts out of citizens and local officials. Each unit contains essential facts, key questions, advice on how to deal with the issues, and clearly-written technical backgrounds. In short, each unit provides the information that citizen advisors need to better fulfill their role.

This program is available through public participation coordinators at the regional offices of the United States Environmental Protection Agency. □

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This project is dedicated to the memory of Susan A. Cole.