To the Graduate Council:

I am submitting herewith a thesis written by Robert A. Purcell entitled "Areawide Water Quality Management Planning: The Development of the 208 Planning Process by Designated Areawide Agencies in North Carolina, Tennessee, and Virginia." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.

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AREAWIDE WATER QUALITY MANAGEMENT PLANNING: THE DEVELOPMENT OF THE 208 PLANNING PROCESS BY DESIGNATED AREAWIDE AGENCIES IN NORTH CAROLINA, TENNESSEE, AND VIRGINIA

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ABSTRACT

The purpose of this study was to describe the areawide waste treatment management planning process established by Section 208 of Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972. The thesis describes the 208 planning process, its functions, and its relationships to other planning and implementation programs. Particular attention was paid to designated 208 planning agencies in North Carolina, Tennessee and Virginia—especially those which have produced interim outputs.

A variety of methods and procedures were used in gathering information for this thesis. The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) was studied extensively, as were Federal regulations and guidelines concerning the 208 process and related programs. Library sources were consulted for information concerning environmental planning, land-use planning, institutional arrangements, and principles of public finance and taxation. Several conferences were attended which concerned the 208 areawide planning and implementation process, public participation methods, and program management. Questionnaires and personal interviews were used to provide information concerning views of "208" planners and other planners in

areawide and state agencies, as well as views of Environmental Protection Agency (EPA) 208 project coordinators.

The major findings of the thesis included that the 208 process is complex; it varies somewhat from area to area; it will be limited in its initial accomplishments due to lateness in its starting, compared to other programs; but, it has the potential for enormous impact upon local governments, waste treatment agencies, and areawide planning agencies.

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CHAPTER I

INTRODUCTION

I. GENERAL INTRODUCTION

When Congress passed Public Law 92-500—the Federal Water Pollution Control Act Amendments of 1972—over a Presidential veto, it enacted what "is generally considered one of the most complex pieces of technical legislation to emerge from Congress."[1] Often referred to as "the Act" because it contains such significant additions to the previous federal water pollution control act, its purpose is to "restore and maintain the chemical, physical and biological integrity of the Nation's waters."[2] The legislation . . .

> . . . departed in several ways from previous water pollution control legislation. It expanded the Federal role in water pollution control, increased the level of Federal funding for construction of publicly owned water treatment works, elevated planning to a new level of significance, opened new avenues for public participation and created a regulatory mechanism requiring uniform technology-based effluent standards, together with a national

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[1] Moore, Gardner & Associates, Inc., 208 Areawide Wastewater Management Plan—Work Plan for the Fifth Planning District, Roanoke, Virginia (Roanoke, Virginia: Moore, Gardner & Associates, Inc., March 28, 1975), pp. 1-2.

[2] U.S. Congress, An Act to Amend the Federal Water Pollution Control Act, 92d Sess., October 18, 1972, Public Law 92-500, S. 2770, Section 101(2).

> permit system for all point source dischargers as the means of enforcement.[3]

The Act established planning as the essential device for integrating the permit system, construction grants, controls of pollution sources, and "projected growth and predicted land use changes into a reasonable formula for local pollution control, attuned to both state and local needs, solutions and priorities."[4] Section 208 of the Act established an areawide waste treatment management planning program which is required for all geographic areas of the United States. Known as "208 planning" it is considered "the main planning mechanism to implement the requirements of the Act."[5]

II. AREAWIDE WASTE TREATMENT MANAGEMENT PLANNING

Areawide planning, in accordance with Section 208:

> . . . charts a course not only for cleaning up of polluted waters but also for the prevention of future pollution by identifying problem sources, regulating construction of certain industrial

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[3]National Commission on Water Quality, Staff Draft Report, Issues and Findings (Washington, D.C.: National Commission on Water Quality, 1975), p. I-1 (emphasis added).

[4]Ibid., p. I-68.

[5]Harold F. Wise, A. I. P.; Elizabeth H. Haskell; Robert C. Einsweiler, A. I. P.; and John J. Bosley, Esquire. Institutional Assessment of the Implementation of the Planning Requirements of the Water Pollution Control Act Amendments of 1972 (Washington, D.C.: National Commission on Water Quality, August, 1975), p. II-21.

facilities, and developing processes to control runoff sources of pollution.[6]

The object of 208 planning is to achieve the 1983 goal of the Act—the attainment of fishable and swimmable waters in all areas of the United States. Though initially limited by EPA to "areas which, as a result of urban-industrial concentrations or other factors, have substantial water quality control problems,"[7] areawide (208) planning must be completed for all areas of the country by November 1, 1978.[8]

Purpose of "208" Planning

The purpose of the "208" planning process is to formulate an areawide waste treatment management plan that can be implemented by a management agency or agencies. The planning process must integrate both technical needs for pollution control and management arrangements capable of implementing the controls.[9] Section 208 enables areawide planning

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[6]Judge John Lewis Smith. Natural Resources Defense Council, Inc. and the Environmental Defense Fund, Inc., vs. Russell Train and National Forest Products Association (Washington, D.C.: U.S. District Court for the District of Columbia, July, 1975).

[7]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, Section 208, Federal Water Pollution Control Act Amendments of 1972 (Washington, D.C.: Environmental Protection Agency, May 3, 1974), P. I-1.

[8]Judge John Lewis Smith, loc. cit.

[9]U.S. Environmental Protection Agency, The Challenge and Opportunity of Water Quality Management Planning, Questions and Answers About Section 208 of the Federal Water Pollution Control Act as Amended (Research Triangle Park, N.C.: Triangle J Council of Governments, August, 1974), p. 2.

agencies to develop a comprehensive program controlling municipal and industrial waste water, storm and sewer runoff, nonpoint sources, and land use as it relates to water quality.

Method of Accomplishing "208" Planning

Areawide waste treatment management (or "208") planning is designed as a two-year study which focuses on "an integrated approach for identifying and controlling the most serious water pollution problems initially and, over time, resolving the remaining problems."[10] Emphasis is placed on nonstructural approaches to solving pollution problems, in order to reduce the need for investments in treatment facilities.

Areawide planning may be undertaken by a single representative organization which includes elected officials (or their designees) from local governments in the planning area—or by a State agency. It is the responsibility of the states "to designate eligible areawide planning agencies to perform intensive areawide planning for those areas of the state which[11]. . . as a result of urban-industrial concentrations or other factors, have substantial water quality

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[10]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, p. 1-1.

[11]U.S. Environmental Protection Agency, "Grants to State and Designated Areawide Planning Agencies—Conditions, Policies, and Procedures," Federal Register, Vol. 40, No. 230, Friday, November 28, 1975, p. 55321.

control problems."[12] The States also have the responsibility to undertake 208 planning in areas which are not designated for planning by areawide or local planning agencies.

> Judge Smith's decision affirmed that nondesignation under Section 208 (2)(6) was not the preferred method of undertaking planning under the Section. Under this opinion, the State appeared to be the planning agency of last resort in areas having substantial problems, or the preferred agency in rural areas where prevention was to be the main thrust of the effort.[13]

The governor of each State is required to designate a state planning agency to be responsible for the planning required of the State.[14] This State agency "may delegate portions of its responsibilities to other State, Federal, local, or interstate agencies"[15] but

> Locally elected officials of major general purpose units of government, and other pertinent local and areawide organizations within the jurisdiction of a proposed local or interstate planning agency, shall be consulted prior to any delegation of planning responsibility to an agency made pursuant to § 130.14 (a).[16]

The State and designated areawide planning agencies must develop a planning process which will establish the "necessary institutional arrangements and management

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[12] Ibid., p. 55339.

[13] Wise et al., Institutional Assessment (August, 1975), p. IV-6.

[14] U.S. Environmental Protection Agency, Federal Register, Vol. 40, No. 230, November 28, 1975, Section 130.12, p. 55339.

[15] Ibid.

[16] Ibid., Section 130.14, p. 55340.

programs to make and implement coordinated decisions designed to achieve water quality goals and standards."[17] The governors of each state are required to make "final decisions as to designatable areas and agencies by April 26, 1976."[18] And, the State is responsible for assuring "that each element of the State's approved planning process is achieved."[19] Management of the planning program for a designated area, however, is the responsibility of the designated areawide planning agency.

> The planning process shall include:
> 1. adequate public participation in developing, reviewing, and adopting the plan;
> 2. adequate intergovernmental input in developing and implementing the plan;
> 3. adequate coordination with related Federal, State, interstate and local planning authorities;
> 4. the preparation of a water quality management plan in accordance with requirements of applicable regulations; and,
> 5. establishment and implementation of the regulatory programs required to implement the plan.[20]

To assure adequate public, intergovernmental and inter-agency input in developing the "208" plan, designated

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[17]Ibid., Section 130.10, p. 55338.

[18]Letter from James E. Holshouser, Jr., Governor, to Chief Elected Officials, Local and Regional Units of Government, State of North Carolina, "Actions with respect to Section 208 of the Federal Water Pollution Control Act Amendments of 1972," January 26, 1976.

[19]U.S. Environmental Protection Agency, Federal Register, Nove,ber 28, 1975, Section 130.12, p. 55330.

[20]Ibid., Section 130.13, p. 55339.

areawide planning agencies are required to establish a policy advisory committee (or utilize an existing policy advisory committee) "to advise the responsible planning or implementing agency during the development and implementation of the plan on broad policy matters, including the fiscal, economic, and social impacts of the plan."[21]

> The policy advisory committee for designated areawide planning areas shall include representatives of the State and public and may include representatives of the U.S. Departments of Agriculture, Army, and the Interior, and such other Federal and local agencies as may be appropriate in the opinion of EPA, the State(s), and the designated planning agency.[22]

The policy committee must provide coordination between the 208 planning agency and programs carried out by the participating members of the committee. The committee will review the plans developed by the 208 planning agency when they are developed, revised, and submitted for adoption. Thus, 208 planning is to be accomplished through a method that fosters coordination, cooperation, and public participation.

Required Contents of "208" Plans

Areawide Waste Treatment Management (208) planning must address both short- and long-range objectives, including specific outputs such as technical requirements for permits,

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[21]Ibid., Section 130.16, p. 55340.

[22]Ibid.

locations for facilities and their treatment levels, construction priorities, and measures for control of nonpoint source problems.[23] The plan shall include, but not be limited to, the following outputs:

1. Identification of treatment works necessary to meet municipal and industrial needs of the 208 area over a 20-year period.

2. Planning for facilities for which step 2 or step 3 grant assistance[24] is expected during the five-year period following 208 plan approval.

3. Identification of systems required to control urban stormwater runoff.

4. Establishment of construction priorities for five- and twenty-year periods.

5. Establishment of a regulatory program to provide for waste treatment management on an areawide basis; identification and control or treatment of all point and nonpoint sources; and regulation of the location of and construction of treatment facilities and pretreatment requirements.

6. Identification of agencies to carry out the plan.

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[23] U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, pp. 1-2 and 1-3.

[24] Step 2 grants are for detailed design or engineering of facilities planned for under Step 1. Step 3 grants are for facilities construction.

7. Identification of nonpoint sources of pollution and procedures and methods to control these sources to the extent feasible.

8. Development of processes to control residual waste and land disposal of pollutants to protect ground and surface water quality.

9. Identification of alternative management systems and selection of a management system to implement the plan.

10. A schedule for implementing the plan, which should include identification of the costs of implementation.

11. Certifications that the plan is consistent with other plans and that public participation requirements have been fulfilled.

12. Recommendations of key local governments regarding State certification and EPA approval.[25]

Criteria for "208" Plans

The Federal Water Pollution Control Act Amendments and EPA's guidelines for 208 planning contain criteria for developing wastewater management programs which are: (1) cost-effective; (2) implementable; and, (3) publicly acceptable.

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[25]Public Law 92-500. Section 208 (b) (2); and U.S. Environmental Protection Agency, Draft Guidelines for Area-wide Waste Treatment Management Planning, p. 1-4.

The management program (particularly as it relates to municipal treatment works and controls for storm sewers and combined sewers) should include a cost-effectiveness analysis featuring a systematic comparison of alternatives in order ". . . to identify the solution which will minimize total costs to society over time to reliably meet given goals or objectives."[26] Total costs to society include: (1) resource costs, (2) social costs, (3) environmental costs, and (4) economic costs. A cost-effective solution must minimize total costs to society while being technically reliable as an alternative for meeting the 1983 goals of the Act.[27]

Designated 208 Planning Areas and Agencies

By June 30, 1975, a total of 149 agencies, nationally, had been awarded 100 percent federal grants to develop "208" plans for designated "208" planning areas.[28] Most of these "208" agencies are Regional Planning Agencies, Councils-of-Governments, or Economic Development Districts. However, 16 percent of the 208 agencies represent various types of governmental units, including county governments, water

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[26]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, p. 1-4.

[27]Ibid.

[28]Centaur Management Consultants, Inc., National Profile of Section 208 Areawide Management Planning Agencies (Washington, D.C.: Environmental Protection Agency, July, 1975), p. VII.

quality agencies or sanitation districts, and a state office of planning. These agencies will have over 800 persons working full time on 208 staffs, will utilize 800 other persons on a temporary basis and will contract for 400 to 1,000 man-years of consultant time to develop 208 plans.[29]

The requirements of the 208 planning process will have significant impacts on the designated agencies. Many agencies have had to recruit technical staff for their "208" planning program, with no certainty as to their ability to retain the staff beyond the two-year initial planning period. Many agencies have been required to change their accounting systems to meet grant conditions. Conversion to an indirect cost rate, where indirect costing had not been used previously, has caused initial problems for some agencies. And, many agencies have been required to establish new systems for the procurement of consulting services, as a result of 208 grant regulations. These are just some of the many impacts on "208" agencies. Many other impacts result from the planning process itself—and its requirements for interagency and intergovernmental coordination and public participation throughout the planning process.

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[29]Ibid., p. 1.

III. THE PLANNING PROBLEM

Areawide water quality management planning under Section 208 deals with land-use as it relates to what the Act refers to as "point" and "nonpoint" sources of pollution. A "point source" is defined as:

> . . . any discernible, confined and discrete conveyance, including . . . any pipe, ditch, channel, tunnel, conduit, well, discrete operations, or vessel or other floating craft, from which pollutants are or may be discharged.[30]

As a result, "208" planning deals with considerations concerning the location, amount and type of discharge from such "point" sources as industries, municipal sewage treatment plants, subdivisions, and large agricultural feedlots. But, "208" planning also is concerned with "nonpoint" sources, which are defined as:

> . . . any nonconfined area from which pollutants are discharged into a body of water, i.e. agricultural run-off, and sedimentation from construction sites.[31]

Thus, 208 planning is also concerned with storm-water runoff from agricultural areas (which may include nutrients and pesticides), urban runoff (including dirt from streets, nutrients from urban lawns, etc.), erosion from construction sites, etc.

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[30] Izaak Walton League of America, A Citizen's Guide to Clean Water (Washington, D.C.: Environmental Protection Agency, 1973), p. 88.

[31] Ibid.

In order to deal with both "point" and "nonpoint" sources, the "208" program is intended to implement a plan which addresses new treatment systems (i.e., nonstructural approaches). Areawide water quality management planning also involves fiscal controls and institutional and financial arrangements. Thus, the program must adequately relate existing governments of various types and powers to an area-wide management agency or agencies. The program must also include adequate financial arrangements for carrying out the plan.

With the establishment of this program, Congress has created a tool that will have a great deal of impact on the communities which presently have significant water quality problems. The program, because of its scope, EPA regulations, etc., will also have a large impact on the planning agencies that have or will become involved with it. These points will be explored later in this thesis. However, no 208 plans have been completed yet, so there are no precedents that can be used for describing and evaluating 208 planning. More needs to be known about 208 planning, so it can be used as effectively as possible.

IV. PURPOSE OF THIS STUDY

While 208 planning is not far enough along to evaluate completed plans, it is possible to gain a greater understanding of the anticipated impact of the program by

taking a closer look at what the program is intended to do, how it is intended to perform its function, and what the planners who are involved with the 208 program expect to accomplish. It is the purpose of this study to take such a look at the 208 program and present information which deals with the agency planning process, legislative considerations, administrative and procedural regulations regarding the coordination and implementation of 208 projects and the view of EPA officials, State agencies, and existing 208 planning agencies concerning the relationships between 208 and other planning programs, the methodologies that have developed, the State role in the planning process, and the anticipated effectiveness of various technical and management alternatives for implementing the plan.

V. ASSUMPTIONS AND SCOPE OF THE STUDY

This study is intended to describe the 208 planning process and its relationships with other EPA programs and other areawide planning programs. The study does not attempt to describe or evaluate completed 208 plans. It describes and delineates 208 planning in terms of Federal legislation, EPA guidelines, and the opinions of a sample of EPA, State, and 208-designated-agency officials. It is assumed that the views of the planners and officials who responded to interviews and questionnaires are representative of other

persons who are in similar positions with EPA, State governments, and local and regional planning agencies.

VI. METHOD OF ACCOMPLISHING STUDY

The study used a dual approach, including: (1) a literature review, and (2) both an interview-schedule and a questionnaire. The literature review consisted of a survey and analysis of current legislation, regulations, and EPA guidelines as well as pertinent books and periodicals related to "208" planning. The interview-schedule involved personal and telephone interviews with a sample of EPA, State, and metropolitan or regional planners or officials who are involved with 208 planning or land-use planning. The questionnaire was sent to planners with selected 208 planning agencies.

The sample selected for purposes of the study includes EPA's "208" coordinators for Regions III and IV; State planning officials in North Carolina, Tennessee and Virginia, and planners in the local or regional planning agencies in the three previously mentioned states where "208" areas and agencies were designated prior to December, 1974.

The survey techniques were used to determine State and Federal perspectives of the 208 planning process and its relation to other planning programs. In addition, specific questions were concerned with how the States plan to coordinate the 208 agencies and their activities and how 208

planning will be coordinated with other planning programs, including other environmental planning programs.

VII. ORGANIZATION OF THE STUDY

The remainder of this thesis is organized as follows:

Chapter II deals with the 208 planning program's relationships with other programs—including, other provisions of the Federal Water Pollution Control Act Amendments of 1972; other EPA programs; and, other areawide management programs.

Chapter III describes the 208 planning process both from the standpoint of Federal guidelines, and the views of planners in designated "208" agencies, and discusses the coordination of 208 planning activities by the States and the EPA regions.

Chapter IV describes the alternative implementation techniques for "208" planning, such as: facilities construction; regulatory programs; financial arrangements and fiscal controls; and institutional arrangements.

Chapter V summarizes the method and scope of 208 planning and the anticipated impacts on designated agencies; summarizes the implementation techniques and their anticipated impacts; and presents general conclusions arising from the study.

CHAPTER II

PROGRAMMATIC RELATIONSHIPS AND AUTHORITIES

The Federal Water Pollution Control Act Amendments of 1972 ("the Act") sets water quality standards and provides mechanisms for curbing pollution on a staged basis.[1] Section 208 of the Act gives local governments an important tool for reaching the national water quality goals established by the Act. This tool can best be understood within the context of the standards established by the Act and the other mechanisms for meeting the standards. It is also important to understand the relationships between 208 planning and other EPA environmental programs, as well as relationships between 208 planning and other State, local and regional planning programs.

I. RELATIONSHIPS BETWEEN SECTION 208 AND OTHER FWPCAA PROVISIONS

The original Federal Water Pollution Control Act (FWPCA) was enacted by Congress in 1948 "to enhance the quality and value of our water resources and to establish a national policy for the prevention, control and abatement of water pollution."[2] Subsequent amendments to the FWPCA have

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[1] National Association of Regional Councils, The Challenge and Opportunity of Water Quality Management, p. 1.

[2] Federal Water Pollution Control Act, 1948.

broadened Federal authority in water pollution control, strengthened enforcement provisions, set goals for achieving water quality, and provided tools for the reduction and elimination of water pollution.[3]

These amendments included the Water Pollution Control Act Amendments of 1956, the Water Quality Act of 1965, the Clean Water Restoration Act of 1966, the Water Quality Improvement Act of 1970, and the FWPCA Amendments of 1972. The successive amendments prior to 1972 resulted in "a hodgepodge of law."[4] As a result, the 1972 amendments "restructured the authority for water pollution control and consolidated authority in the Administration of the Environmental Protection Agency."[5]

The objective of the 1972 Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[6] In order to achieve this objective, two goals are established:

> (1) to eliminate the discharge of pollutants into navigable waters by 1985; and,
> (2) to achieve, wherever possible, "an interim goal of water quality which provides for the

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[3]U.S. Environmental Protection Agency, The Challenge of the Environment: A Primer on EPA's Statutory Authority (Washington, D.C.: U.S. Environmental Protection Agency, 1972), pp. 12-13.

[4]Ibid., p. 13.

[5]Ibid.

[6]Public Law 92-500, Section 101(a).

protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" by July 1, 1983;[7]

and standards are set for the enforcement of effluent limitations:

1. Application by July 1, 1977, of the best practicable control technology (BPCT) for point sources, other than publicly owned treatment works;
2. Application of effluent limitations based upon secondary treatment for publicly owned treatment works in existence on July 1, 1977;
3. Effluent limitations by July 1, 1983, which shall require application of the best available technology (BAT) economically available for point sources other than publicly owned treatment works;
4. Compliance of all publicly owned treatment work by July 1, 1983, with the best practicable waste treatment technology (BPWTT) according to a study of alternative waste treatment techniques over the life of works proposed for grant assistance.[8]

The Act also establishes four national policies for the achievement of water quality:

1. that the discharge of toxic pollutants in toxic amounts be prohibited;
2. that Federal financial assistance be provided to construct publicly owned waste treatment works;
3. that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and
4. that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans.[9]

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[7] Ibid.

[8] Public Law 92-500, Section 301(b) and Section 201(g)(2)(A).

[9] Public Law 92-500, Section 101(2).

> . . . In this framework, Congress gave the Administration the legal tools necessary to make inroads into the problems of water pollution control, while continuing to recognize the primary rights and responsibilities of the States to prevent, reduce, and eliminate pollution.[10]

The Act further directs the Administrator to develop "regulations specifying minimum guidelines for public participation"[11] in the "development, revision and enforcement of any regulation, standard, effluent limitation, plan or program established by the Administrator or any state"[12] under the Act. Public participation is to be encouraged and assisted. Duplication and unnecessary delays are to be minimized by minimizing paperwork and interagency decision procedures.[13]

The main mechanisms established by the Act for meeting the water quality goals are the permit program and the Act's planning processes. These mechanisms are designed to deal with both "point" and "nonpoint" sources of pollution.

Permit Program

Section 402 of the Act establishes the National Pollutant Discharge Elimination System (NPDES) as the major mechanism

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[10] U.S. Environmental Protection Agency, The Challenge of the Environment, p. 13.

[11] Public Law 92-500, p. 1.

[12] Ibid.

[13] Ibid.

to regulate discharges from point sources. NPDES permits:

> . . . regulate discharges into navigable waters from all point sources of pollution, including industries, municipal treatment plants, large agricultural feedlots and return irrigation flows.[14]

Industries which discharge into a municipal treatment system are exempt from this requirement to obtain a permit, but must meet pretreatment standards for the removal of "incompatible and untreatable wastes."[15] The permits are valid for up to five years.

> . . . The core of the permit will be a specific "schedule of compliance" which prescribes an enforceable sequence of actions or operations leading to compliance with an effluent limitation, prohibition, or standard. For example, such a schedule might set dates for design, engineering, construction, or process changes.[16]

Through this mechanism, all point sources are required to reduce pollutants step-by-step over a specified period of time. "No permits may be issued for point sources which are in conflict with approved 208 plans since they automatically become part of the overall 303(e) basin plans.[17]

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[14]Izaak Walton League of America, Citizen's Guide to Clean Water (Washington, D.C.: Environmental Protection Agency, 1973), p. 51.

[15]Ibid., pp. 51 and 27.

[16]Ibid., p. 51.

[17]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, p. 2-2.

Furthermore, the 208 plan must designate a management agency(s) which has adequate authority to manage waste treatment works and "to refuse to receive any wastes from any municipality or subdivision thereof which does not comply with any provisions of an approved plan."[18]

Regional Planning

Section 209 of the Act directs the President to prepare a "Level B" plan under the Water Resources Planning Act, for all river basins in the United States. These plans are intended to relate water pollution control and water resources management efforts.[19] The President shall prepare these plans "as soon as practicable" acting through the Water Resources Council.

State Basin Planning

Section 303(e) of the Act is designed to "relate water quality data to permits and assure that the compliance schedule under the permit is stringent enough to protect the quality of the receiving waters."[20] Plans developed under this section are the responsibility of each state. The plans are developed from studies of individual river basins. All

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[18]Public Law 92-500, Section 208(c)(2)(B) and (H).

[19]Izaak Walton League of America, A Citizen's Guide to Clean Water, p. 9.

[20]Ibid.

basin plans must include: (1) descriptions of each body of water in the basin; (2) identification and analysis of all pollutant sources; (3) a ranking of each segment of water in order of priority for improvement; (4) an analysis of measures to be taken to improve or maintain water quality; and (5) establishment of a timetable for state actions.[21]

As Figure 1 shows, basin planning can be conceptualized as covering a larger geographical area than either areawide planning (208) or facility planning (201). Broadly speaking, basin plans are prepared for entire hydrological basins or watersheds, or those portions of a hydrological basin which lie within one state.

Basin plans are the "framework within which 208 plans are developed."[22] Basin plans: (1) provide water quality standards and goals, (2) define critical water quality conditions, and (3) provide waste load constraints.[23]

In many cases, 303 basin plans have been developed prior to areawide (208) plans. As a result, a great deal of information that has been developed for the basin plans can be used in the areawide plans. The law stipulates that areawide plans should not duplicate work that has been done

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[21]Ibid., p. 46.

[22]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Management Planning, p. 2-1.

[23]Ibid.

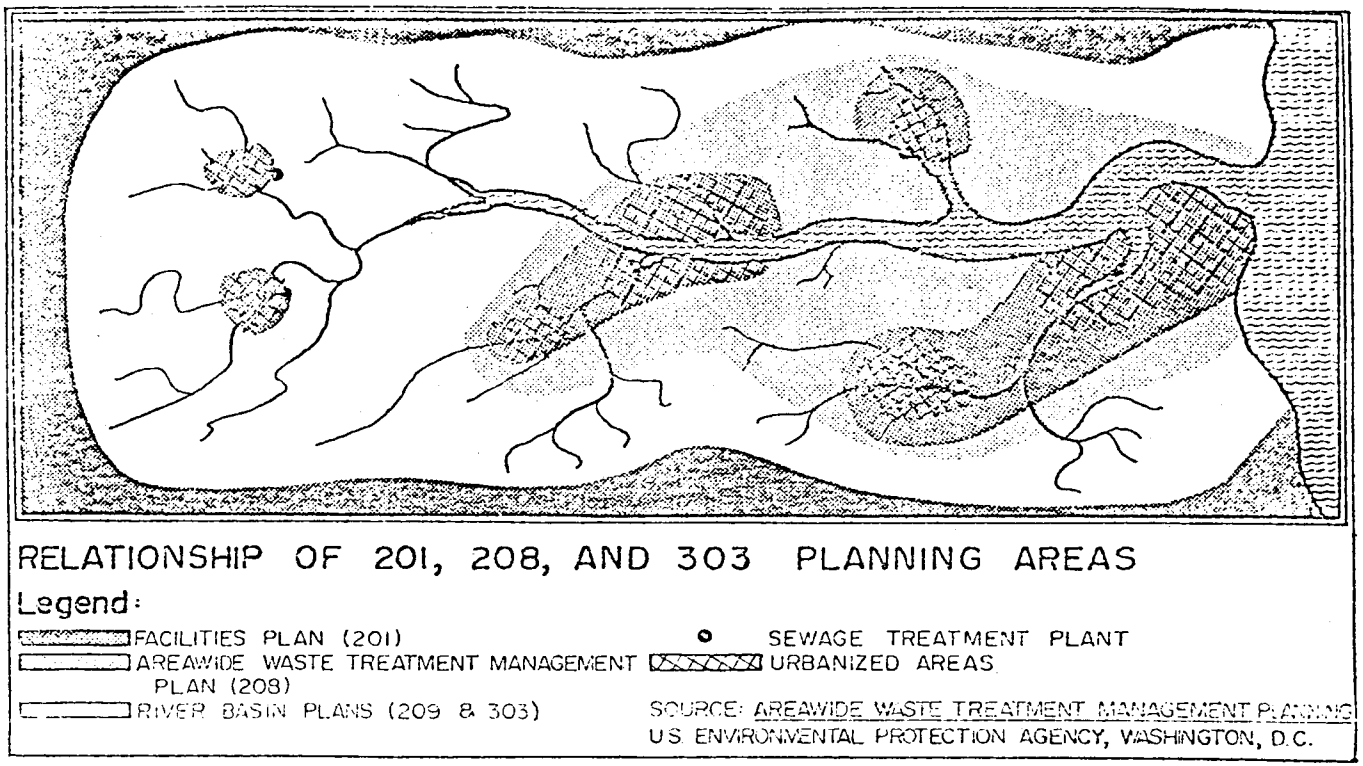


Figure 1

Relationship of 201, 208, and 303 Planning Areas

in basin plans, but the areawide plan may refine wasteload allocations developed by 303 basin plans and the NPDES (402) process.

> . . . The results of 208 planning will constitute an integral part of these basin plans and the delineation of 208 area boundaries may be facilitated by reference to the applicable basin plan.[24]

There is an important working relationship between 208 and 303 plans as the basin plans serve to identify areas which require 208 planning, and provide information which can be used in 208 planning, while 208 plans refine basin plans. Furthermore, the state agency which develops the basin plan will generally have representatives on the Technical Advisory Committees of the 208 agencies within the state and generally will also be represented on a State Review Committee which must certify the 208 plans when they are completed, and when they are updated each year.

Municipal Planning

Section 201 of the Act is designed to develop overall facilities plans for "cost effective, environmentally sound and implementable treatment works."[25] The plans "shall provide for the application of the best practicable waste treatment management technology before any discharge into receiving waters, including reclaiming and recycling of water, and

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[24] Ibid.

[25] U.S. Environmental Protection Agency, Guidelines for Facilities Planning (Washington, D.C.: U.S. Environmental Protection Agency, January, 1974), p. 3.

confined disposal of pollutants so they will not migrate to cause water or other environmental pollution and shall provide for consideration of advanced waste treatment techniques."[26]

As Figure 1 illustrates, facilities plans can, in general, be considered as covering smaller areas and a more limited range of problems than 208 plans. Facilities plans are basically municipal in scope. They may include more than one municipality, and some may cover as much total area as a 208 plan, but they are generally limited to the area that can be served by a regional sewage treatment plant.

Facilities plans are basically limited to finding the most cost-effective means of treating pollution from municipal point sources and industries which are served, or will be served by municipal treatment systems. Facilities plans are not concerned with nonpoint source pollution, or with industries which are not to be served by municipal waste treatment systems. Both of these sources of pollution, however, fall within the province of areawide (208) planning.[27]

While areawide (208) plans must consider both technical and management options for controlling pollution, facilities plans are limited to dealing with problems that can be solved

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[26]Public Law 92-500, Section 201(b).

[27]U.S. Environmental Protection Agency, Draft Guidelines, p. 2-1.

by municipal waste treatment. As their name suggests, they are concerned with planning for new or improved facilities. Facilities plans include "the planning and preliminary design portions of plans and studies (Step 1 elements) related to construction of publicly owned waste treatment works.[28] (Section 201 also provides the authority for "Step 2" engineering grants and "Step 3" construction grants.) Facilities plans are charged with developing cost-effective and environmentally sound municipal wastewater treatment facilities,[29] and application by 1983 of "the best practicable waste treatment technology."[30]

Facilities planning should be considered to be an integral part of areawide (208) planning. Facilities plans which are completed or in progress when an areawide (208) plan is begun should supplement the areawide plan.[31] Approved 201 facilities plans should be considered as "existing" for 208 planning purposes, as far as their

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[28] Ibid.

[29] Ibid.

[30] U.S. Environmental Protection Agency, Guidance for Facilities Planning, p. 3; and Public Law 92-500, Section 201(b).

[31] U.S. Environmental Protection Agency, Guidance for Facilities Planning, p. 8.

facilities which are scheduled for plans and specifications.[32] The 208 plan is more comprehensive than the 201 plan and will consider an integrated approach to waste treatment management. The 201 planning entities will furnish the 208 agency with facilities plans for comments.[33] Coordination between 201 and 208 planning should avoid delaying ongoing facilities planning while achieving maximum consistency with the 208 plan.[34] Agreements between 208 and 201 planning should recognize that 208 considers areawide aspects, including point sources, land use and growth.

II. RELATIONSHIPS WITH OTHER EPA PROGRAMS

Air Quality Programs

Air quality standards have been set for the entire nation by the "Clean Air Act" of 1970. Previous Federal legislation included The Air Pollution Act of 1955, authorizing Federal funding for air pollution research; the Motor Vehicle Pollution Control Act of 1965, which set emission

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[32]U.S. Environmental Protection Agency, Draft Guidelines, p. 2-2.

[33]U.S. Environmental Protection Agency, Guidance for Facilities Planning, p. 8.

[34]U.S. Environmental Protection Agency, Draft Guidelines, p. 2-2.

standards for automobiles; and the Air Quality Act of 1970, which authorized air pollution research and abatement.[35]

The "Clean Air Act" of 1970 was the first Federal law to call for national, uniform air quality standards based on geographic regions. The standards are based on proven harmful effects of individual pollutants. Standards have been established for sulfur oxide, particulate matter, carbon monoxide, hydrocarbons, photochemicals and nitrogen oxide. These standards "establish the minimum amount of each pollutant that will be permitted in the atmosphere consistent with public health and welfare."[36] The States have the responsibility for the submittal of State Implementation Plans (SIP's) for effecting the air quality standards.[37]

The areawide (208) plan is responsible for coordinating with SIP's developed by Air Quality Regions which have planning areas that coincide with any part of a 208 planning area. This coordination is also required where there is an Air Quality Maintenance Area (AQMA). Complementary strategies should be developed for air and water management, ensuring

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[35]U.S. Environmental Protection Agency, The Challenge of the Environment, pp. 5-6.

[36]Ibid.

[37]U.S. Environmental Protection Agency, Draft Guidelines, p. 2-1.

that the 208 planning will be consistent with relevant portions of SIP's.[38]

Solid Waste Programs

The Solid Waste Disposal Act of 1965 established a system of Federal grants for State and local efforts to deal with the effects of solid waste disposal on the environment. In 1970, Congress passed the Resource Recovery Act which dealt with the problems of recycling used resources and "directed new grant programs to urban areas, where solid waste problems were getting out of hand."[39]

State and regional plans for Solid Waste Management should be examined by the 208 planning agency for solutions that can be applied to the 208 area. Measures should be taken to ensure compatability between water quality management provisions and solid waste management planning.

III. RELATIONSHIPS BETWEEN "208" AND OTHER AREAWIDE PROGRAMS

There are a number of areawide programs of other Federal agencies which need to be coordinated with 208 planning. Section 304 (j) of the Act provides that the Administration

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[38] Ibid.

[39] U.S. Environmental Protection Agency, The Challenge of the Environment, pp. 24-25.

of the Environmental Protection Agency shall enter into agreements with the Secretary of Agriculture, the Secretary of the Army and the Secretary of the Interior to provide for maximum utilization of the appropriate programs authorized under other Federal law to be carried out by those Secretaries for the purpose of achieving and maintaining water quality through appropriate implementation of plans approved under Section 208 of the Act. The EPA Administrator and the three Secretaries entered into such an agreement in the Fall of 1973. The EPA Administrator has also entered into a joint assessment with the Secretary of Housing and Urban Development to coordinate HUD's Comprehensive Planning Assistance ("701") Program with 208 planning.

Other Federal programs which may need to be coordinated with 208 planning include programs of the Tennessee Valley Authority (TVA), the U.S. Army Corps of Engineers, the Department of Transportation (DOT), and the National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce. Several such programs, and their relationships to 208 planning are discussed briefly below. These include programs which are concerned with: (1) flood plain management; (2) land-use; (3) nonpoint source pollution; (4) solid waste; (5) transportation; (6) wastewater management; (7) water supply; (8) water resources; and (9) outdoor recreation. These programs and their functions are summarized in Table 1.

TABLE 1

AREAWIDE PROGRAMS TO BE COORDINATED WITH 208 PLANNING

Program Function	Agency/Program: Dept. of Agriculture			Dept. of Interior		EPA		Dept. of HUD			Dept. of Commerce		DOT
	FmHA	SCS	ASC	BOR	Geological Survey	Air and Waste	Water and Hazardous Materials	701	CD	Flood Ins.	SBA	NOAA	Federal Aid Highway
Flood Plain Management	C	D E			D					G H			
Comprehensive Land-Use Planning								A B	B			G	
Nonpoint Source Pollution	C C C	D E	B B										
Solid Waste Management	C					E	E						
Transportation Planning													F/B
Waste Water Management							E F				C		
Water Supply	C C												
Water Resources					D								
Outdoor Recreation				A B	B E								

A—Planning Program
B—Federal Grant
C—Federal Loans
D—Data Survey
E—Technical Assistance
F—Regulations
G—Land Use Controls
H—Insurance

Source: U.S. Environmental Protection Agency, Federal Programs Impacting Water Quality Management, Draft prepared for the Miami Valley Regional Planning Commission (Washington, D.C.: U.S. Environmental Protection Agency, 1976).

Flood Plain Management

Three Federal programs which relate to flood plain management are:

1. The National Flood Insurance Program;

2. The Watershed Protection and Flood Prevention Program; and,

3. The Watershed Protection and Flood Prevention Loans Program.

The most important of these three programs is HUD's National Flood Insurance Program.

National Flood Insurance Program. This program, administered by the Flood Insurance Administration of HUD, requires land-use plans that will minimize flood damage, and provides a Federally-sponsored flood insurance program. It's relevance to 208 planning is obvious, due to provisions concerning: (1) treatment and collection facilities; (2) drainage; and (3) coordination.

Provisions of the flood insurance program which relate to facilities will be particularly important to 208 agencies in their reviews of 201 plans and their consideration of alternative structural solutions. These provisions require that sanitary sewer systems located in a flood zone must be (a) elevated; (b) located and constructed to eliminate (or at least minimize) flood damage; and (c) designed to minimize

or eliminate infiltration of flood waters, or discharges of sewerage into flood waters.

Drainage provisions of the flood insurance program require that communities must give consideration to improving local drainage and to controlling any increased runoff that could increase the danger of flooding or mudslides. These provisions relate to the design of wastewater treatment facilities. They also present a vehicle for implementing recommendations of a 208 plan. As a result, coordination is essential in developing implementation plans for the two programs. This is given impetus by coordination provisions of both programs.

Land use is also a consideration of both programs. Communities which adopt land use controls under the Flood Insurance Program must consider: (1) State and local water pollution control requirements; and (2) the coordination of land use controls and sewer and drainage regulations of the community and surrounding areas. Effective coordination between the two programs can ensure the achievement of both water quality and flood prevention objectives. Coordination of data and projections would be an interim step toward coordination of achievements.

Watershed Protection and Flood Prevention Program. Though not as important as the HUD Flood Insurance Program, this program has some relevance to 208 planning. It is

administered by the Soil Conservation Service (SCS) to provide "technical and financial assistance in planning and carrying out works of improvement to protect, develop and utilize the land and water resources in small watersheds."[40] Objectives of the program include: (1) flood prevention; (2) irrigation; (3) drainage; (4) sedimentation control; (5) fish and wildlife development; and (6) public recreation. Since these objectives closely parallel and, to some extent duplicate, the goals of 208 planning, coordination is essential.

Watershed Protection and Flood Prevention Loans. This program, in effect, helps to implement the technical assistance program administered by the SCS (see above). Administered by the Farmer's Home Administration, it provides loans to eligible local sponsors to provide the local share of the costs of watershed works of improvement. As a result, the program could be utilized to achieve objectives of the 208 plan.

Land Use Planning

The HUD-EPA agreement encourages the use of HUD 701 monies for land use plans to regulate growth in keeping with

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[40]U.S. Environmental Protection Agency, Federal Programs Impacting Regional Water Quality Management. Draft prepared for the Miami Valley Regional Planning Commission (Washington, D.C.: U.S. Environmental Protection Agency, 1976), p. 23.

208 land use control objectives. The two HUD planning programs are:

1. Comprehensive Planning Assistance ("701" Planning) and

2. The Community Development Program.

Comprehensive Planning Assistance. Section 701 of the Housing Act of 1954, as amended (P.L. 83-560) provides support for a broad range of planning and management activities, including planning for land use, transportation, open space, community facilities and water and sewer plans. HUD "701" planning has traditionally been "the country's largest, most pervasive, most encompassing single planning program."[41]

The traditional comprehensive planning approach assumes that control of the land-use pattern could minimize economic and environmental costs. This planning approach traditionally begins with a projection of the amount and type of future economic activity. Projections of future population are based on these economic projections. Demands for commercial, industrial, residential and public land needs are based on these two estimates. Evaluations are made of the suitability and capacity of land for these various land-use activities, with consideration given to location or accessibility, size

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[41]Bernard Cohen, "Stung and Shaken . . . But Surviving," Planning, Vol. 41 (June, 1975), p. 9.

of the parcel, availability of utilities, and general physical quality, including soil characteristics and degree of slope.[42]

In recent years, various approaches have been tried to redefine comprehensive planning in two basic ways: (1) by adding a new environmental planning agency at the local or regional level; or (2) by viewing environmental quality as a facet of the broader goals of comprehensive planning. However, even with these changes, many planning agencies are still only paying lip service to environmental considerations.

The HUD-EPA joint agreement provides for coordinating the implementation of the Comprehensive Planning Assistance (701) Program of the Housing Act of 1954 (as amended) and the Areawide Waste Treatment Management Planning Assistance Program (208) of the Water Pollution Control Act Amendments of 1972. The provisions of this joint agreement include:

1. EPA will accept "701" areawide land use elements as complying with the land use requirements under Section 208.

2. The performance criteria for meeting the land use element will be developed jointly by HUD and EPA.

3. The HUD land use element shall provide long and short term growth policies; the type, intensity and timing

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[42]Edward J. Kaiser, Karl Elfers, Sidney Cohn et al., Promoting Environmental Quality Through Urban Planning and Controls (Washington, D.C.: U.S. Environmental Protection Agency, February, 1974), pp. 45-46.

of growth, studies, criteria, standards and procedures for guiding and controlling growth. The 208 land use evaluation shall determine the most efficient treatment systems consistent with the basic land use plan; and analyze "land-use water quality relationships to determine what modifications should be made to the basic land use plan for the purpose of controlling or managing point and nonpoint sources of pollution."

4. The land-use element must be reviewed and approved by both HUD and EPA.

5. Wherever possible, EPA will encourage the designation of comprehensive planning agencies as 208 agencies.

6. Coordinated work programs will be developed to coordinate 701 and 208 planning grants.[43]

Since it deals with both point sources and nonpoint source pollution, Section 208 is concerned not only with facility planning, but also land-use controls and practices and their possible effects on achieving water quality. "The analysis of land use-water quality relationships should help determine those controls which could be most effective. This should be supplemented by an inventory and analysis of ordinances, regulations and policies such as taxation, which

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[43]Joint Agreement between the Department of Housing and Urban Development and the Environmental Protection Agency.

may have a direct or indirect impact on water quality. At a minimum, the following should be reviewed as they apply to the 208 area:

Zoning
Flood plain zones
Environmental Performance Zoning
Subdivision regulations
Planned Unit Development regulations
Buffer Zones
Conservation and scenic easements
Density bonuses
Housing codes
Construction permits
Development permits
Transferable development rights
Hillside development rights
Grading regulations
Taxation policies
Public Works Policies
Public Investment Policies
Land Conservation Policies
Discharge permits[44]

Community Development Program. Title I of the Housing and Community Development Act of 1974 authorizes HUD to provide grants for Community Development Programs. The emphasis of the programs is on the provision of decent housing, a suitable living environment and expansion of economic opportunities. Large scale water and sewage facilities are not eligible under the program. However, some water and sewage treatment facilities are eligible, as well as flood and drainage facilities where assistance is not

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[44]U.S. Environmental Protection Agency, Draft Guidelines, pp. 4-5.

available from other Federal programs.[45] This program has at least some possibility of aiding the implementation of 208 objectives.

Nonpoint Source Pollution

There are nine programs administered by the U.S. Department of Agriculture (USDA) which can contribute to solving nonpoint source problems such as agricultural runoff. These include programs of the Soil Conservation Service (SCS); the Agricultural Stabilization and Conservation Service (ASCS);and, the Farmer's Home Administration (FmHA). These programs are:

1. Soil and Water Conservation Assistance (SCS);
2. Soil Surveys (SCS);
3. Soil and water loans (FmHA);
4. Watershed Protection and Flood Prevention technical assistance (SCS);
5. Watershed Protection and Flood Prevention Loans (FmHA);
6. Irrigation, Drainage and other Soil and Water Conservation loans (FmHA);
7. Water Bank Program grants (ASCS);
8. Agricultural Conservation Program Grants (ASCS); and,

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[45]U.S. Environmental Protection Agency Water Planning Division, Federal Programs Impacting Regional Water Quality Management, op. cit., p. 35.

9. Resource Conservation and Development Loans (FmHA).

Soil and Water Conservation. The Soil Conservation Service (SCS) administers this program. Its objective is the provision of technical assistance for soil and water conservation planning. This service is provided to landowners and land users through SCS offices which are generally located in every county. Implementation is considered as well as planning, with technical information being provided to government bodies for use in devising land use controls, and sanitary codes and building codes and standards. The SCS can particularly assist a 208 program "in determining what kind of soil conservation practices would best meet water quality goals."[46] This can be accomplished through any of several arrangements, such as:

1. A limited assistance agreement;

2. Assignment of an SCS employee to a 208 agency, under an Intergovernmental Personnel Act (IPA) transfer;

3. A contractual arrangement between a 208 agency and an SCS office; and,

4. The funding of a Soil and Water Conservation District by the 208 agency along with the assignment of SCS staff to assist the agency.

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[46]Ibid., p. 22.

Such arrangements can be particularly helpful to a 208 agency. SCS membership on a 208 Advisory Committee would provide at least a minimal degree of coordination. Lack of any arrangement would deprive a 208 study of a valuable input and could also result in inefficiencies in nonpoint control programs.

Soil Survey. The SCS also provides soil surveys. Published soil surveys are usually produced by counties, though they may be done for comparably sized areas. The use of a soil survey "could provide the 208 agency with an inventory of existing and potential nonpoint pollution sources."[47]

Soil and Water Loans. As administered by the Farmers Home Administration (FmHA), this program is intended to help improve, protect and assure the proper use of farm land by providing financial and supervisory assistance to farmers. Objectives include soil conservation; water development; conservation and use; reforestation; drainage of farmland; establishment and improvement of permanent pasture, etc. Known as SW loans, this program can be used to assist in the control of nonpoint source pollution, especially agricultural runoff. Thus, there are benefits to the 208 agencies in coordinating with FmHA offices in developing alternative

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[47] Ibid., p. 20.

plans for implementation. "Farmlands within the 208 area that present particularly severe nonpoint pollution problems, for example, might be given top priority for SW loans if cooperation was obtained from local FmHA officials.[48]

Watershed Protection and Flood Prevention Program. Mentioned previously as a flood plain management program, this SCS program could be of importance in controlling nonpoint sources. Coordination is essential to assure that mutual objectives are carried out within small watersheds where SCS is providing technical assistance for improvement works.

Watershed Protection and Flood Prevention on Loans. Also mentioned above, the program helps finance watershed improvement works. This can be important in rural areas in implementing the best management practices for nonpoint sources. Priority systems for making loans could be jointly established by the 208 agencies and local FmHA offices. This could ensure effective use of funds and avoid overlapping programs for achieving nonpoint source control.

Irrigation, Drainage and Other Soil and Water Conservation Loans. This loan program is also administered

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[48]Ibid., p. 15.

by FmHA. It represents a means of financing nonpoint source controls to be implemented in rural areas. Cooperation between 208 agencies, FmHA, and local banks could result in giving priority to areas where nonpoint problems are severe and can be effectively dealt with by these measures.[49]

Water Bank Program. This program, as administered by ASCS can "provide grants to conserve wetlands; preserve and improve migratory waterfowl habitat and wildlife resources, and secure other environmental benefits and agricultural production limitations . . ."[50] thereby contributing to the 208 goal of conservation of wildlife. Compatability between areawide plans and conservation plans could help achieve reduction of nonpoint problems. This may be true where grants encourage less intense use of land where a particular nonpoint source problem exists.

Agricultural Conservation Program. As administered by the ASCS, this program is designed to protect agricultural lands through assuring their wise use. This is to be accomplished through sharing with farmers, ranchers and woodland owners the costs of carrying out practices designed to conserve soil, water, woodland, forests and wildlife.

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[49]Ibid., pp. 6-7.

[50]Ibid., p. 18.

Since it stresses sediment control, it presents another means of reducing nonpoint source pollution.[51]

Resource Conservation and Development Loans. The Farmers Home Administration (FmHA) is authorized by this program to provide loans for such uses as:

> 1. rural community public outdoor oriented water-based recreational facilities;
> 2. soil and water, development, conservation, control and use facilities;
> 3. shift-in-land-use facilities;
> 4. community water storage facilities; and,
> 5. special purpose equipment to carry out the above purposes.[52]

A primary use of these RC&D loans has been for roadbank seeding. By cooperating with FmHA, this program could be coordinated with 208 objectives concerning prevention of erosion and sedimentation problems.

Solid Waste

There are presently only two Federal programs in operation which have direct impact on solid waste. These are EPA's Solid Waste Technical Assistance, Training and Information Services, and FmHA's Resource Conservation and Development (RC&D) program. Congress has recently been considering solid waste and resource recovery legislation which could expand the present minimal Federal involvement.

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[51] Ibid., pp. 16-17.

[52] Ibid., p. 12.

Solid Waste Technical Assistance Training and Information Service. Administered by EPA's Office of Air and Waste Management, this program provides public authorities and agents with technical information to help solve local solid waste problems such as disposal systems and resource recovery. EPA technical information and consultive services can provide 208 agencies with help in identifying new applications of solid waste management for alleviating nonpoint source problems caused by waste disposal practices. It can also assist in planning, programming and budgeting of solid waste management programs. In addition, EPA is proposing that grants be provided to state, regional and local planning agencies to study solid waste disposal practices and to develop new solid waste disposal plans. Thus, the program has potential for assisting in implementation of 208 objectives.[53]

Resource Conservation and Development. As mentioned previously, the primary water quality-related purpose for which the RC&D loans have been used has been for roadbank seeding to control sediment erosion. However, the loans are also available for solid waste facilities and equipment (including landfills and incinerators).[54]

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[53]Ibid., pp. 28-29.

[54]Ibid., pp. 10-11.

Transportation Planning

Transportation plans, whether done by the state, or by a local government, have significant impacts on land use and the location of facilities. As a result, there is a great need to coordinate 208 planning and transportation planning.[55]

Federal and Highway Program. This program authorizes the Federal Highway Administration (FHWA) of the Department of Transportation (DOT) to construct interstate highways and to build and improve primary, secondary and urban roads and streets. The Federal-Aid Highway Program Manual establishes regulations which state highway departments must adhere to in regard to erosion and sediment control on highway construction projects which use Federal funds. Coordination and cooperation between 208 agencies and state highway departments can help ensure that new construction, right-of-way acquisition, and roadside beautification are compatible with water quality objectives of the 208 plan.[56] Lack of cooperation could result in increased nonpoint source problems, and unwise and inefficient use of Federal funds.

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[55]Ibid., pp. 5, 47-48.

[56]Ibid.

Waste Water Management

There are at least three other Federal programs directly related to waste water management besides EPA's "201" facilities grants program. These include: (1) EPA's State and Local Manpower Development Program; (2) Loans to Small Businesses under P.L. 92-500; and, (3) Water and Waste Disposal Systems for Rural Communities.

State and Local Manpower Development Program. This program authorizes EPA's Office of Water and Hazardous Materials to design and carry out training programs related to waste treatment technology, including training operators for advanced treatment plants. This may provide for an important need, if it can't be met by the state.[57]

Loans to Small Businesses. Section 8 of the Act (P.L. 92-500) amended Section 7 of the Small Business Act to authorize the Small Business Administration (SBA) to make loans to small businesses which are significant polluters—for the purpose of making changes in equipment, facilities, or methods of operation as required to meet provisions of the water pollution control act.[58] A 208 agency could assist small businesses which are significant polluters in getting such loans. This could be done by alerting them to the

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[57]Ibid., pp. 33-34.

[58]Ibid., pp. 44-46.

availability of the loans and informing the EPA Regional Administrator of the water pollution problems to be alleviated through use of the loan funds. By so doing, a 208 agency may be able to gain the cooperation of small businesses in solving point and nonpoint source problems of an industrial or commercial nature.[59]

Water and Waste Communities. This program, administered by the Farmers Home Administration provides loans and grants to rural communities for installing, repairing, improving or expanding rural water supply or sewage systems. Since the guaranteed loans and grants can be used for the 25 percent local share of 201 facilities costs, it can be of great importance in rural areas. Coordination between 208 agencies and FmHA offices can result in meeting 208 objectives in rural areas.[60]

IV. SUMMARY OF 208 RELATIONSHIPS WITH OTHER PROGRAMS

Development and implementation of a successful "208" areawide water quality management plan requires close coordination with many other programs. Among the related programs are several that were also established by the Federal Water

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[59] Ibid.

[60] Ibid., pp. 8-9.

Pollution Control Act Amendments of 1972. These include the NPDES permit program (402), "Level B" (209) planning, State Basin Planning (303(e)), and municipal sewage treatment facility planning (201).

The linkages between "201" municipal facility planning are of particular importance since completed "201" plans, in essence, become part of an area's "208" plan. Similarly, the connection between areawide "208" planning and 303(e) planning is that "208" plans, when completed, must be certified as being in accordance with the State's Basin Plan—the draft basin plan having provided input to the development of the "208" plan.

Other programs which have impact on the "208" planning process are many and varied. Some of the programs, such as TVA stream monitoring and EPA technical assistance, can provide data and other inputs for the "208" planning process. A number of the other programs may, by careful coordination, become part of the implementation process.

The following chapter (Chapter III) describes the process of developing a "208" plan. Part of the analysis concerns how some of the related programs mentioned in Chapter II can be integrated into the planning process.

CHAPTER III

THE 208 PLANNING PROCESS

The 208 process has been described as being extremely complex. There is justification for this view. The complexity begins even before an agency has received a grant from EPA. The complexity continues throughout the process of developing a plan-of-study and completing an approved plan.

Chapter III consists of a detailed description of this complex process. This description consists of narration of EPA requirements for the process and the views of selected 208 planners, state and regional planners, and EPA officials. Together, these materials present a picture of Federal requirements for the program, and perceptions of what it might accomplish.

I. DESIGNATION AND GRANT APPLICATION

As of June 30, 1975, there were 149 agencies throughout the United States which were designated and funded for 208 planning. Most of these agencies (113 or 84 percent) are a Regional Planning Agency, Council-of-Governments, or Economic Development District. Most of these agencies have prior experience with other planning programs, particularly HUD 701

planning and areawide transportation planning, and are a regional A-95 review agency.[1]

Designation of Area and Agency

In order to become a 208 agency, the planning agency was required to go through a designation process. This consisted of designation by the governor of the state, or a direct request by the agency to EPA for designation for 208 planning.[2]

In order for designation of an area and agency to be approved by EPA, it is necessary to develop a document called a "designation package," have at least one public hearing and get resolutions of intent from appropriate units of local government.

The public hearing is required to obtain citizen input into the delineation of the planning area and selection of the planning agency. The "designation package" consists of a document which compiles information concerning the planning area's boundary, population growth and concentration, water quality factors, local government intent, public

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[1]Centaur Management Consultants, Inc., National Profile of Section 208 Areawide Management Planning Agencies (Washington, D.C.: Environmental Protection Agency, July 1975), pp. 3-6.

[2]Centaur Management Consultants, Inc., Area and Agency Designation Handbook for Section 208 Areawide Waste Treatment Management Planning (Washington: D.C.: Environmental Protection Agency, December, 1974), p. 19.

participation, factors for agency designation, and estimate of planning costs.[3]

Resolutions of intent consist of consent of local governments in the planning area to the planning and necessary implementation of the 208 program.[4] The resolutions are required to be approved by all local governments whose cooperation is necessary for carrying out the planning process. EPA requires these resolutions even though it is too early for local governments to know what they are agreeing to implement.

Requirements of Designated Agency

Before a designated agency is awarded a 208 grant, it must comply with various EPA regulations for grant administration. These requirements include having an approved indirect cost rate, and an acceptable accounting and procurement system. For many 208 agencies, this means radical changes in internal budgeting and administration of grants.

Pre-grant audit. EPA's practice is to have a pre-grant audit of designated agencies before they have been offered a grant. This allows for a determination of any changes that may be necessary in the agency's accounting system to comply

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[3]Ibid., pp. 1-31.

[4]Ibid., p. 19.

with EPA regulations.[5] It also serves as a method of verifying the agency's proposed indirect cost rate. This is important, since many of the agencies did not previously have approved rates. Once the rate is approved, it must be applied uniformly to all Federal grants which the agency receives. As a result, this requirement for an EPA grant has repercussions on the accounting and administration of all of an agency's Federal grant programs.

Grant Application

Agencies that have received official designation as 208 agencies may then apply for a grant. The process consists of developing a preliminary work plan and detailed budget. Also included are objectives of the planning process, outputs, description of areawide advisory committee structure, an explanation of the financially self-sustaining continuing planning process, state certification, and A-95 requirements.

Consultant Procurement

The designated agencies must also have an approved system for procuring contractual services and supplies. For many agencies, this means developing a new, formalized system for dealing with consultant contracts. Since most 208

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[5]See Federal Register, Vol. 40, No. 90, Thursday, May 8, 1975, Part III. U.S. Environmental Protection Agency, "Grant Regulations and Procedures. Revision of Part."

agencies rely heavily upon consultants to provide at least part of their expertise for 208 planning, such a system is essential.

The consultant selection process must be objective, unbiased, and thoroughly documented. Criteria must be established for selecting consultants and proper procedures must be adhered to.

After consulting firms have been chosen, the 208 agency must evaluate the accounting systems of the selected firms.[6] This is necessary in order to determine the adequacy of cost information and to verify an approved indirect cost rate prior to contract negotiations.

Agencies are required to thoroughly document contract negotiation and selection of contract type.[7] Cost analysis is also required and must be documented for all contracts in excess of $10,000. For contracts in excess of $100,000, the formal cost and price analysis must be submitted to EPA for review and approval.[8]

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[6]U.S. Environmental Protection Agency, Office of Audit, "Checklist for Evaluating Contractor/Grantee Accounting System and Related Procedures" (Atlanta: U.S. Environmental Protection Agency, Region IV, September, 1975).

[7]Federal Register, Vol. 40, No. 91, Friday, May 9, 1975, Proposed Rules, Section 35.937-1, "Type of Contract," p. 20303.

[8]Scott P. Berdine, 208 Project Officer, memo to all 208 project directors, "Cost and Price Analysis" (Atlanta: U.S. Environmental Protection Agency, Region IV).

Staff Recruitment

In addition to procuring consultants, most designated agencies must also recruit additional staff to perform 208 functions. Often this means adding technical expertise that was not previously available to the agency, though internal transfers may also take place.

II. GUIDELINES FOR 208 PLANNING

The 208 planning process is both complex and highly-structured. EPA has evolved an intricate process that must be followed in developing a 208 plan.

Some designated planning agencies had previously been engaged in environmental planning programs, including HUD water and sewer plans, and EPA metropolitan and regional (M/R) studies. Planners on the staffs of the agencies were generally familiar with environmental planning procedures as developed by McHarg and procedures for evaluating environmental impacts. However, 208 planning is more complex, and contains its own overall methodology, though it may borrow from other sources and may utilize such inputs as remote-sensing, computerized modeling, gaming, and the Delphi technique.

EPA publications describe the 208 planning process as consisting of two basic elements—technical planning and management planning. Before this planning process can begin,

a plan-of-study (POS) must be developed. As a step in preparing a POS, data is reviewed, and problems are identified and prioritized.

Problem Appraisal and Plan-of-Study

EPA Region IV has developed a process for identifying and ranking problems before developing the plan-of-study. This process is both time-consuming and complicated. However, it is generally considered a necessary step in putting an existing situation into perspective before moving on to other steps.

Technical supplement. The U.S. Environmental Protection Agency, Region IV, has developed a 208 Planning Process Strategy Technical Supplement which is designed to assist agencies in developing plans-of-study. The procedure requires analyzing existing technical information to supplement organizational requirements.[9]

Specifically, the procedure consists of a five-step approach for developing a plan-of-study. First, all available data are assembled and tables are completed which summarize the data for each identified stream segment.

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[9] 208 Planning Process Strategy Technical Supplement (Atlanta: U.S. Environmental Protection Agency, Region IV, Interagency Liaison Staff, Water Division, October, 1975), p. 1.

Second, a map is constructed which shows the location of each delineated stream segment. The map is a simple linear stick map, with straight lines representing each segment. The map locates the major waste sources within the area. There are the waste sources which are described in the data tables.

Third, a "parameter analysis" table is completed for each identified segment. This table indicates which parameters (such as dissolved oxygen, coliform bacteria, pH, heavy metals, temperature, etc.) violate existing water quality standards or impair 1983 water use goals. The table also indicates whether problems are caused by point sources or nonpoint sources, and provides for a ranking of the severity of the problem parameters.

Fourth, an "evaluation summary" is completed for each segment. This procedure relates pollution sources to various control programs. Table 2 lists the sources which are considered and the various programs which may address them.

Fifth, an "output appraisal" is completed. This consists of a lengthy table which lists possible outputs of a 208 plan and indicates which outputs are applicable to the subject 208 area; which outputs will be produced by the initial two-year planning process; and, which outputs will be deferred, together with the reason for deferral. Thus, completion of the Technical Supplement delineates the scope of the technical portion of the plan.

TABLE 2

POLLUTION SOURCES AND CONTROL PROGRAMS

Pollution Sources	Control Programs
A. Substantial Point Sources	(a) 201 Plan
1. Substantial Industrial	
2. Substantial Urban Storm Drainage	(b) 303(e) State Basin Plan
3. Combined Sewer Overflow	(c) 402 NPDES Permit System
B. Substantial Nonpoint Sources	(d) 208 Initial Two-Year Planning Period
1. Agriculture	
2. Silviculture	(e) 208 Annual Updates
3. Mining	
4. Construction	(f) Other Programs
5. Septic Fields	
6. Benthic (sludge)	
7. Feedlots	
8. Other	
C. Groundwater Pollution	
1. Contamination of groundwater of major water source	
2. Groundwater pollution contributing to surface water problem	
3. Complex groundwater problem	
4. State or area groundwater goal	
5. Salt water intrusion	
6. Others	

Source: 208 Planning Process Strategy Technical Supplement (Atlanta: U.S. Environmental Protection Agency, Region IV, Interagency Liaison Staff, Water Division, October, 1975), p. 12.

Analysis of management needs. An analysis of management needs is done along with the collection and analysis of technical data. This analysis considers existing and feasible agencies of general purpose state and local government, special districts, multi-purpose agencies, or any combination of these. The analysis includes the functions, organizational structure, powers and funding of the agencies.[10]

This analysis is essential, since the 208 agency must propose which specific institutional alternatives will be analyzed by the 208 study. Table 3 lists the factors to be analyzed on a preliminary basis to identify municipal wastewater management needs.

The analysis consists of an inventory of legal authorities established by state legislation and local ordinances, and an examination of actual practices of existing agencies within the study area. In addition to analyzing the authorities and practices of existing agencies, the procedure also requires review of 201 facilities plans to determine what methods are available for managing new facilities proposed by the plans.

Problem appraisal. After developing information for a "technical supplement" and the analysis of municipal

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[10]Elizabeth H. Haskell, Management Agencies Handbook for Section 208 Areawide Waste Treatment Management (Washington, D.C.: U.S. Environmental Protection Agency, September, 1975), p. 1.

TABLE 3

FACTORS TO BE ANALYZED TO DETERMINE MUNICIPAL WASTEWATER MANAGEMENT NEEDS

For Cities Which Currently Operate Sewage Treatment Plants

1. Present authorities for:

   (a) designing, constructing and operating waste treatment works;
   (b) accepting and using grants;
   (c) raising revenues and assessing waste treatment charges;
   (d) incurring short- and long-term indebtedness;
   (e) requirements to effect proportionate share for treatment costs;
   (f) ability to refuse wastes from entities not complying with provisions of an approved plan;
   (g) planning and monitoring of implementation.

2. Present approaches used, or available:

   (a) user fees and charges; including compliance with 201 grant conditions;
   (b) revenues for operation, maintenance, and replacement;
   (c) revenues for new construction;
   (d) sewer system rehabilitation and maintenance;
   (e) construction and maintenance of urban storm drainage works;
   (f) amortizing present indebtedness;
   (g) planning and monitoring of implementation.

Source: Letter from Calvin Taylor, Chief, Interagency Liaison Office, USEPA, Region IV, to all 208 Project Directors and State 208 Staffs, dated December 18, 1975.

wastewater management needs, a "problem appraisal" is completed. The problem appraisal consists of identifying problem parameters and setting priorities for problems and geographical areas to be addressed. This problem appraisal is reviewed by state and regional EPA staff. After approval, the problem appraisal is presented at a public hearing to obtain citizen input. Following the public hearing, work is begun on the final work plan, or plan-of-study.[11]

Development of plan-of-study. The evaluation summary and output appraisal become part of the first section of the plan-of-study. They delineate what will be done to accomplish the objectives of the planning process. Table 4 summarizes the required contents of the plan-of-study.

The plan-of-study contains a description of previously performed work in order to ensure its utilization and avoid duplication. The planning process itself is described in sufficient detail that the plan-of-study may be used to define the scopes-of-services for consultant contracts. The description includes the objectives of each specific work task, the methodology, required inputs, and a delineation of the outputs and the cost. A detailed schedule and critical

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[11]Letter of November 19, 1975 from Calvin C. Taylor, Chief, Interagency Liaison Office, U.S. EPA, Region IV, to "All 208 Agencies."

TABLE 4

REQUIRED CONTENTS OF 208 PLAN-OF-STUDY

Required Contents
The Plan-of-Study must contain the following elements:
1. a description of the objectives and scope of the planning process;
2. a description of previously performed work which will be used in the planning process;
3. a description of the proposed planning process;
4. a description of any action to be taken by other agencies as a necessary part of the planning process;
5. a detailed schedule, including a critical path diagram;
6. a detailed cost and resource budget;
7. a proposed disbursement schedule;
8. a description of methods for coordination with plans prepared under sections 201, 209 and 303(e) to ensure compatability among the plans;
9. a description of procedures used in assuring adequate public participation in the planning process; and,
10. a description of committees, their composition, functions, and dates of projected meetings.

Sources: Memorandum of February 20, 1976 from Scott P. Berdine, 208 Project Officer, Interagency Liaison Office, to "All FY-75 Agencies," and 40 CFR Part 35, 1054-2F.

path diagram and detailed cost and resource budget are essential to ensure efficient management of the process.

Agreements with other agencies for assistance in providing information are included to ensure that necessary data are available when needed. This includes agreements with state and municipal planning programs. Finally, the plan-of-study includes information concerning the use of advisory committees and public participation procedures for input into the planning process. This is of particular importance since EPA regulations require that the general public be actively involved in the planning process, including the development of proposed alternatives. Mere passive involvement, through public information programs and presentation of a completed plan at a public hearing, is not sufficient to meet this mandate.

The plan-of-study is generally developed by the 208 agency and its consultants. Plans-of-study must be completed within one year of designation, and must be certified by the state and approved by EPA.

Technical Planning

The technical planning portion of the 208 planning process is concerned with developing a coordinated strategy for abating water pollution through the use of controls on: (1) land use and growth; (2) municipal wastewater systems; (3) industrial effluents; and, (4) nonpoint sources. The

consideration of control alternatives is intended to assure that noncapital intensive options are considered, provided that these options help to attain the goals of the Act.[12]

The 208 planning process also includes a detailed examination of 201 facilities plans to determine whether or not they are compatible throughout the 208 area (which may include several 201 planning areas) and whether or not they properly address storm and combined sewer overflow considerations. This technical planning must be "undertaken in close cooperation with agencies possessing land use planning and control authority in the 208 area."[13]

Technical inputs. Figure 2 shows the 208 planning steps as identified in the EPA publication, Executive Summary of Section 208 Program for Designated Areas (October 1974). The technical inputs into this planning process include information from the state planning process and 201 facilities plans; information from NPDES permits, related water information; and other technical information.

The technical inputs from the state plans will include water quality assessments and segment classifications;

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[12]U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Treatment Management Planning, p. 3-2.

[13]Ibid., p. 3-3.

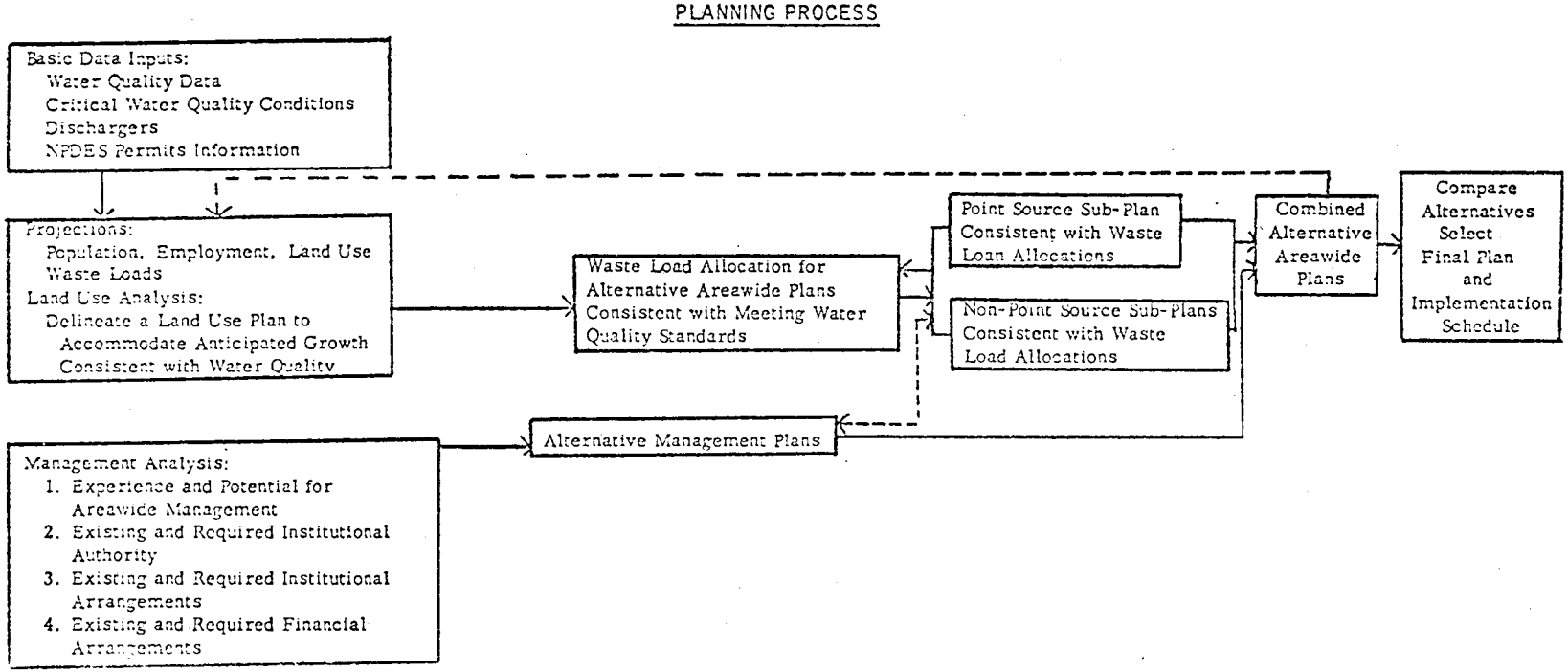


Figure 2

"208" Water Quality Management Planning Process

Source: U.S. Environmental Protection Agency. Executive Summary of Section 208 Program for Designated Areas. Federal Water Pollution Control Act Amendments of 1972 (Washington, D.C.: U.S. Environmental Protection Agency, 1974).

inventories and projections of dischargers; revisions of standards; total maximum daily loads; and, wasteload allocations.[14]

Though 208 plans were originally intended to be the key planning element of the Act, facilities plans in many areas have begun prior to 208 plans. As a result the 201 facilities plans are expected to provide a great deal of information for the 208 planning process. These inputs are listed in Table 5. The level of sophistication of these inputs will vary from area to area, depending upon the approved plan-of-study for the 201 area, and the contract between the local agency and its consultant.

Other inputs may include water and sewer studies conducted under HUD, FmHA, or ARC grants, TVA water quality monitoring, reports of water supply agencies, or Corps of Engineers Urban Studies. Other technical information which might be used as inputs to the 208 planning process includes geological and soil surveys, environmental assessments, wildlife studies, recreation and transportation plans.

Planning sequence. The 208 planning process identified by EPA consists of 10 steps, as enumerated in Table 6. The process begins with the identification of water quality

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[14] Ibid., p. 2-14. Note: these requirements stem from Sections 303, 305(b) and 314, and the Act.

TABLE 5

FACILITY PLAN INPUTS TO 208 PLANNING PROCESS

Information Required
1. A preliminary estimate of municipal and industrial wastewater flows to be generated during the 20-year planning period.
2. A preliminary identification of the costs of alternative treatment systems for handling the projected wastewater flows and meeting the requirements for best practicable waste treatment technology, or more stringent limitations.
3. A preliminary comparison of the costs of alternative wastewater collection systems.
4. A preliminary determination of the most cost-effective system for collecting and treating municipal wastes.
5. Possible financial and institutional arrangements for constructing, operating, and maintaining municipal treatment facilities.
6. Information on industrial cost-recovery and other user charge analyses.
7. Data concerning pretreatment and sewer-use ordinances.
8. Information on rehabilitation needs and operation and maintenance costs of the municipal treatment system.
9. Analyses of sludge disposal alternatives.

Source: Sample "Memorandum of Agreement for the Purpose of 201-208 Coordination and Support," U.S. Environmental Protection Agency, April 5, 1976.

TABLE 6

PLANNING SEQUENCE FOR 208 AREAWIDE WATER QUALITY MANAGEMENT PLANNING

Planning Sequence
1. Identify water quality problems and standards.
2. Construct an inventory of point and nonpoint source discharges.
3. Prioritize planning, choose design conditions for dry weather and wet weather conditions and select an analytic model to relate source loads to water quality.
4. Collect existing data and perform necessary surveillance and monitoring of streams.
5. Calibrate and verify monitoring information.
6. Project population, employment, land-use and waste loads for the planning period.
7. Analyze segments; for water quality segments, determine total maximum daily loads and eligible sets of waste load reductions; and test sets of waste load reductions to determine whether they enable meeting standards.
8. Determine alternative subplans of treatments, control, and flow reduction, consistent with eligible waste load reductions.
9. Screen subplans to select leading alternative subplans consistent with eligible waste load reductions.
10. Combine subplans into alternative areawide plans consistent with eligible waste load reductions.

Source: U.S. Environmental Protection Agency, Draft Guidelines for Areawide Waste Treatment Management Planning, August, 1975, page following p. 3-2.

problems and standards. The next step is to inventory the industries, municipalities, subdivisions, schools and other facilities which discharge directly into the area's streams. Nonpoint sources such as large dairy farms, orchards, strip mines and silvicultural operations also are inventoried. Having inventoried these dischargers, 208 planners then set priorities, choose design conditions, and collect data. Collection and analysis of data are necessary to make projections and develop alternative subplans. Finally, the alternative subplans are evaluated, combined alternative plans are developed and a final plan is chosen, with active input from the general public and public officials who must implement the plan.

Management Planning

The management planning process is required in order to develop a system for implementing the plan. The management system that is developed must be feasible and reliable. It must have adequate legal authority to plan, design, construct, operate and maintain waste treatment systems and to receive grants.[15] It must also have adequate financial capability

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[15]U.S. Environmental Protection Agency, Draft Guidelines, op. cit., p. 3-12.

to construct and operate a treatment system, and to finance indirect costs.[16]

Management analysis. The first step in the process of developing the management plan is to analyze previous water quality management experience of agencies in the 208 area. This is a necessary step to evaluate the capabilities of existing agencies to meet the management requirements of the Act and to determine what changes may be needed to satisfy the requirements.[17]

The management analysis must consider the area's potential for water quality management on a regional basis. This entails determining if areawide facilities have been proposed by 201 plans; if legislative authority exists for areawide management; what changes are required to implement an areawide management system; and, what financial arrangements are necessary to ensure the capability of the management system to meet its financial needs and obligations.

The 208 study should attempt to assess the present effectiveness of existing institutions for carrying out the necessary management functions on a regional basis. It should determine if these institutions have the necessary authorities listed in Table 3, page 61.

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[16] Ibid.

[17] Ibid.

The institutional assessment for the planning process is more detailed than that undertaken prior to developing the plan-of-study. Having determined which specific institutional agencies are to be considered as parts of a proposed management system, it is necessary to determine if existing agencies have authority to carry out these functions on a regional basis.

Management and institutional analyses should determine the attitudes of local public officials and public citizens toward regional management systems. Opinion surveys should attempt to determine whether a single regional agency or several local agencies which collectively have the necessary authority can be implemented effectively in the study area.

The 208 study examines the relationships between Federally funded regional planning authorities and the regional or local wastewater treatment authorities. It also studies the relationships between regional or local wastewater treatment authorities and other local agencies whose activities have an impact on water quality, including agencies concerned with water supply, solid waste disposal, transportation, and land-use planning.

This portion of the 208 process attempts to determine what new enabling legislation or supplementary legislation may be required to implement a 208 plan. Emphasis is placed upon how existing laws might be used and the types of contractual agreements or other arrangements that might be

employed. Alternative financing methods, including user charges, are evaluated to determine their capability for meeting financial needs of a wastewater management system.

Development of alternative management plans. When management analysis has been completed, alternative management plans are developed, based on the foregoing analysis. It is important that alternative management plans be developed in close coordination with the alternative technical plans.

The management alternatives which are developed should be examined to determine their reliability for carrying out the plan and their feasibility for being implemented. The following criteria should be used to determine feasibility and reliability: (1) legal authority; (2) operational effectiveness; (3) practicality; (4) coordinative capacity; and, (5) public accountability.

Criteria for operational effectiveness might include: economic efficiency, equity, political accountability and administrative efficiency. Determination of economic efficiency would consider economies of scale, and achievement of water quality goals at minimum costs; equity would be determined by a fair distribution of costs and benefits over the entire population; political accountability is controlled by affected residents in relation to their stakes in the

outcome of an agency's decisions. Administrative efficiency relates to assignment of adequate powers to each agency; ability to pursue intergovernmental cooperation and reduce interlocal functional conflict; adequacy of funds; compatibility with existing governmental institutions; and flexibility of the system to consider alternatives and trade offs.[18]

Plan Evaluation and Selection

The planning process should be carried out with close coordination between technical planning and management planning. The alternative technical plans and parallel alternative management plans can then be evaluated by combining corresponding technical and management plans; compiling information on the alternative plans; comparing the alternatives and selecting a final plan; and, developing a detailed description of final plan features.

Comparison of alternative plans. The comparison of alternative plans and the selection of an areawide plan should be based on a systematic evaluation of the known or probable effects of the various alternative plans. Effects that should be considered include: (1) contribution to

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[18]Haskell, Management Agencies Handbook, p. 8.

water quality and other related water management goals of the area; (2) technical reliability of the proposed structural and nonstructural controls; (3) monetary costs; (4) environmental effects; (5) economic and social effects; (6) implementation feasibility and reliability; and, (7) public acceptability.

Implementation feasibility and reliability can be assessed through attitude surveys and investigations of experiences in other areas. Public deliberation is an essential element in comparing the merits of alternatives and selecting the final plan. This may take many forms, such as 208 workshops and public hearings, gaming and simulation, discussion groups, and surveys.

The final plan may be a composite of desirable features of various alternative plans. The process of final plan selection should be an iterative process—allowing reconsideration of an option or subplan whenever it may lead to a better overall plan.[19]

Plan outputs. In addition to technical and management outputs, the final overall plan should also include provisions for performance assessment, plan revision and updating, reports on the planning process, and procedures for local

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[19]U.S. Environmental Protection Agency, Draft Guidelines, op. cit., p. 3-16.

government review and recommendation, state review and approval, and EPA review and approval of completed 208 plans.[20] The output should include a critical path chart depicting the sequence of plan implementation steps and their timing.

III. THE 208 PROCESS--A VIEW FROM DESIGNATED AGENCIES

Questionnaires which were distributed to selected 208 planning agencies during the summer of 1975, and interviews of planning officials within these agencies, provide an overview of how the process is expected to be implemented. The agencies which were contacted were eight agencies in North Carolina, Tennessee, and Virginia. Each of the agencies was designated for 208 planning prior to December, 1974. However, none has yet completed a 208 plan, and most were still in the early stages of the planning process when they responded. As a result, their responses are not based on analyses of completed plans, but mostly on assumptions derived from knowledge of the planning process. However, collectively, they represent an up-to-date analysis of the 208 process by those who are most intimately involved.

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[20] U.S. Environmental Protection Agency, 208 Guidelines, op. cit., pp. 3-22, 3-23.

Agencies Surveyed

The eight designated agencies surveyed included one in North Carolina, four in Tennessee, and three in Virginia. The North Carolina agency was the Triangle J Council of Governments, which serves the Raleigh-Durham area. The Tennessee agencies were the Chattanooga Area Regional Council of Governments, the Knoxville-Knox County Metropolitan Planning Commission, the Mississippi-Arkansas-Tennessee Council of Governments/Development District (Memphis area), and the Mid-Cumberland Council of Governments & Development District (Nashville area). The three Virginia agencies were the Fifth Planning District Commission (Roanoke area), the Peninsula Regional Planning District Commission (Hampton Roads area), and the Richmond Regional Planning Commission.

Types of agencies. Five of the agencies surveyed are regional agencies with multi-county jurisdiction. The three exceptions are the Knoxville, Hampton Roads, and Richmond agencies. The Knoxville-Knox County Metropolitan agency serves a single county. The Peninsula Regional Planning District Commission (Hampton Roads) is a single-purpose agency serving two planning regions. The Richmond Regional Planning District Commission is a multi-jurisdictional 208 agency.[21]

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[21]Source: Questionnaire distributed to eight 208 agencies. The questionnaire appears as an appendix to this study.

Relationships with local governments. Since most of the 208 agencies surveyed are Councils-of-Governments, Development Districts, or Regional Planning Agencies, they already have governing boards made up of local elected officials. However, even in these cases, it is typical to have a special 208 Policy Committee. The establishment of a special committee is often necessary since the membership of the agency's governing body may not include all agencies which are involved in the 208 process and will be involved in implementation of the plan. A more typical reason for having a special 208 Policy Committee, though, is that not all local governments within the region are contained in the 208 area. Since the 208 area is generally centered around an urban area, it is often smaller than the entire sub-state region in which it is contained. Having a special 208 Policy Committee tends to concentrate attention on the specific problems addressed by the program.

Relationships with other programs. The most common method established by the agencies to coordinate with 201 facilities planning, 303(e) state basin planning and programs of related technical agencies, is to provide for representation on a 208 Technical Advisory Committee. Such committees provide 208 agencies with necessary outside expertise and serve to provide coordination among programs. Coordination with 201 programs is seen as being important since the 201

plan will be finished prior to 208 planning and will be an input into the 208 process. The coordination with the state water quality planning agency is also considered important since the 208 plan will serve as a technical refinement to the basin plan. In addition to state membership on a 208 committee, the state may also assign staff to review progress of the 208 process in order to facilitate final review and certification.[22]

Assistance from Other Programs

Other programs which the 208 planners expect to be beneficial in providing inputs or in assisting in implementation include the Tennessee Valley Authority; the U.S. Soil Conservation Service; the U.S. Department of Interior, U.S. Geological Survey; the U.S. Army Corps of Engineers; various departments of state government; a university; and, EPA. State agencies mentioned specifically were the Tennessee Department of Public Health, Division of Water Quality Control; Tennessee State Planning Office; Tennessee Department of Geology; and, the Virginia State Health Department.

Of the many agencies listed, the U.S. Soil Conservation Service (SCS) was mentioned most frequently as being particularly helpful to the 208 process. This was due to two main considerations. First, the SCS was expected to be an

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[22]Ibid.

important source of information concerning agricultural nonpoint sources of information. And, secondly, the SCS was expected to be important in identifying solutions to nonpoint source problems.

The importance to 208 programs of such agencies as TVA, the Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and air quality and solid waste programs, etc., varied from area to area—two expected TVA to be an important source of information (Chattanooga and Knoxville), while Nashville did not. Six of the eight agencies, however, expected the Corps of Engineers to contribute to their 208 projects. The Hampton Roads Peninsula 208 is the only agency surveyed which has coastal areas within the designated 208 area, but the Triangle J 208 also expected to use information from the National Oceanic and Atmospheric Administration, which is the Federal agency involved in Coastal Zone Management (CZM).[23]

Relationships with Land-Use Planning Programs

Most 208 agencies have ongoing land-use planning programs, funded by the Department of Housing and Urban Development (HUD). In addition, the local governments within the 208 area also have HUD Federal 701 planinng programs, as do the states. National land-use planning has

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[23]Ibid.

been proposed and may become a reality within a few years, possibly while current 208 plans are still underway. Table 7 summarizes the views of the 208 planners surveyed concerning the importance of these programs.

Local land-use planning was seen as the most important of these programs.

TABLE 7

RELATIONSHIPS BETWEEN SELECTED LAND-USE PLANNING PROGRAMS AND 208 PLANNING

	Responses of Seven Selected Agencies**				
Program	Very Limited	Limited	Moderately Important	Important	Very Important
Local Land-Use Planning				3	4
Regional Land-Use Planning			1	4	2
State Land-Use Planning			4	2	1
National Land-Use Planning*	1	2	3		

*The Hampton-Roads 208 agency did not respond to the question concerning "National Land-Use Planning."

**The seven agencies responding were:

1. Chattanooga Area Regional Council of Governments
2. Fifth Planning District Commission (Roanoke)
3. Knoxville-Knox County Metropolitan Planning Commission
4. Mississippi-Arkansas-Tennessee COG/Memphis Delta Development District
5. Mid-Cumberland COG/Development District
6. Richmond Regional Planning Consortium
7. Triangle J Council of Governments (Raleigh-Durham, N.C.)

Source: 208 agency questionnaire.

One reason for the importance attached to these programs is the anticipated benefits expected from land-use regulations in limiting nonpoint source pollution (see Chapter IV). Since these controls are implemented by local governments, coordination between local planning and 208 planning is essential.

Hugh Teaford, 208 Project Director for the Mississippi-Arkansas-Tennessee Council of Governments/Memphis Delta Development District, sees the possible effects of changes in land-use as having two impacts:

> The first impact would be during construction. This may be the most severe. Second, the long term impact of the changed land use on water quality . . .[24]

Another Project Director, Don Parnell of Knoxville, expresses the related idea that . . . "To the extent that there is a relationship between land use and water quality, zoning ordinances and other regulatory measures which influence the spatial distribution of land uses and the intensity of development will effect water quality."[25]

Regional land-use planning is also of importance for a related reason. Though not implemented directly, regional plans can serve as a guide for local implementation. Since regional plans and 208 plans are generally developed by the

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[24] Ibid.

[25] Ibid.

same agency, the regional plan can assist in coordinating local efforts in developing land-use controls for implementing the 208 plan. State planning may have somewhat the same function for regions within a state as regional planning has for local planning. National land-use planning, if and when it is implemented, may also become important in setting standards for environmental planning and control.

208 Agency Interrelationships

Since most 208 agencies are multi-purpose regional planning agencies, they typically have several programs underway which have potential impact on 208 planning. Regional land-use planning is just one such program. Other programs and functions include economic and community development, energy and transportation planning, population and economic base studies, data gathering, computerized information systems, and modeling.

Table 8 summarizes comments of selected 208 agency planners and officials concerning the interrelationships between 208 and certain other existing or potential areawide programs.

A-95 Review. The A-95 review process was mentioned as a means of effecting 208 recommendations concerning locations and types of development, including recommendations concerning transportation, housing, and water and sewer.

TABLE 8

INTERRELATIONSHIPS BETWEEN 208 AND OTHER AREAWIDE PLANNING PROGRAMS

Program or Function	Number Mentioning	Input to 208	Implements 208	Implemented by 208
A-95 Review	1		+	
Comprehensive Planning	2	*	*	*
Environmental Planning	1	*	*	*
Data Base/Information System		+		
Computer Land-Use Model		-	-	-

Legend: + indicates positive relationship
- indicates EPA is not allowing 208 funds for this purpose
* indicates an agency is trying to unify these programs with 208.

Source: Interview of planners and officials of selected 208 agencies.

Comprehensive planning/environmental planning. Two agencies specifically mentioned their intention of tying 208 planning to other programs. One of the agencies indicated that it was developing the 208 plan as a management decision-making process in order to reduce pollution through the use of land-use controls. The waste water study under 208 would also serve as an enlargement of the Environmental Planning Section of the agency. The other agency integrates 208 with other agency functions by utilizing expertise of 208 personnel in developing general plans and reviewing subdivision proposals. In addition, administrative staff may assist 208 personnel in financial analysis, development of utility program and systems analysis.

Information system and data base. Since 208 plan development requires a strong technical data base, there is much potential for using existing data and contributing new data to an agency's data base or information system. At first glance it might be expected that the 208 process, because of its high level of funding, would generate more data for use of other programs than it would obtain from the other programs. However, responses from 208 agency planners and officials indicate that this is not expected to be the case. Rather, the 208 process will often use previously developed land-use categories, information on geology, soil, slope, undevelopable lands, etc. At least one agency does

not expect 208 to add much to the data base. But, the 208 study is expected to come up with data to substantiate water quality relationships in the area.

Computer land-use model. Though one agency had anticipated using 208 funds to develop a computerized land-use model, it could not get EPA approval. Thus, based on the information from the agencies surveyed, the contribution of 208 to the data base of the parent agency is not expected to be particularly great. However, this is not true across the board. The Triangle J 208 project staff includes a computer programming supervisor,[26] and in-house computer hardware.

Methods of Evaluating Management Alternatives

A summary of the ideas for evaluating management alternatives includes applying standards such as cost-effectiveness, and potential for implementation. Cost-effectiveness would, in one view, be measured according to criteria to be developed by a consultant. But technical committees and workshops for city and county officials and staff personnel were seen as the methods for evaluating the potential for implementation.

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[26]U.S. Environmental Protection Agency, 208 Area Profiles (Atlanta: U.S. Environmental Protection Agency, Region IV, 1975), p. 43

Mechanisms for Public Participation

Since public involvement is a requirement of 208 planning, it is not surprising that all agencies surveyed responded that they had established mechanisms for public participation. All of the agencies indicated that they would hold a series of public meetings and public hearings (a minimum requirement). Other mechanisms mentioned were information depositories, newsletters, citizen advisory committees, special field exercises and public education seminars, workshops, speeches, multi-media presentations, presentations by staff to local citizen groups, and news articles.

Public Interest Groups

Public interest groups are expected to be important in developing 208 plans. However, the degree of importance may depend upon the willingness of such groups to participate throughout the process. As one 208 Director stated, the agency "will provide the opportunities—whether they take advantage of them will determine their importance."[27]

IV. STATE RELATIONSHIPS WITH AREAWIDE 208 PROCESS

States are intimately involved in the 208 process. In June of 1975, Judge John Lewis Smith, Jr., of the U.S.

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[27] Ibid.

District Court for the District of Columbia, handed down a decision which clarified the extent of the state's role in 208 planning:

> . . . Under this opinion, the state appeared to be the planning agency of last resort in areas having substantial problems, or the preferred agency in rural areas where prevention was to be the main thrust of the effort.[28]

While the state will be involved in 208 planning in nondesignated areas, the state also has an important role in relation to 208 planning in designated areas. This state role is crucial, since state certification must be obtained at four key points in the areawide planning process: (1) designation of the area and the planning agency; (2) grant application; (3) plan-of-study approval; and (4) final plan approval. This is important since EPA will not approva a plan-of-study or final plan without prior certification by the state.

State Role in Designation

The state has an essential role in the designation process. The governors are required by the Act to designate, or "nondesignate" all areas of their states. However, the

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[28]Harold F. Wise, A. I. P.; Elizabeth H. Haskell; Robert C. Einsweiler, A. I. P.; John C. Bosley, Esq., Institutional Assessment of the Implementation of the Planning Requirements of the Water Pollution Control Act Amendments of 1972, Final Report (Washington, D.C.: National Commission on Water Quality, August 29, 1975), pp. IV-5 to IV-6.

chief elected officials within an area may collectively designate an area and planning agency if the governor has not acted within one-hundred-and-eighty days after the publication of the guidelines.[29]

State Role in Approving Grant Application

State certification is required before a grant application will be approved by EPA. This gives the state leverage to require a designated agency to allocate part of its 208 budget to the state to pay for coordination and other services.

State Role in Approving Plan-of-Study

The state must certify a Plan-of-Study prior to EPA approval. As a result, 208 agencies must ensure that the state agency is satisfied with the priorities established by the planning process and the methods of addressing the priorities. This can help ensure coordination between planning programs for designated agencies and the statewide planning for nondesignated areas.

State Role in Approving 208 Plans

State certification of the final 208 plan is required prior to EPA approval. Without such approval, a 208 agency

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[29]Public Law 92-500, October 18, 1972, Sections 208 (2), (3) and (4).

cannot receive final payment for its work. Also, based on contract clauses suggested by EPA,[30] consultants will not receive final payment from the planning agency prior to approval of the plan. As a result of these considerations, 208 agencies and their consultants can be expected to be particularly interested in coordinating with the state agency in developing the plan.

Certification by the state is a necessary step in the process, since completed 208 areawide plans become an integral part of the State Basin Plan. The 208 plans will add non-point source information, and institutional and fiscal analysis to the information contained in the 303(e) Basin Plan. It will also add the mechanism for managing wastewater treatment and controlling nonpoint sources on an areawide basis. This management system may be made up, in part, of state agencies. Coordination between the state and the designated agencies is, therefore, of vital importance.

State mechanisms for 208 coordination. It is a common practice for pertinent state agencies to be represented on the Technical Advisory Committee and Policy Committee of designated 208 agencies. However, adequate program coordination can require a considerable amount of time from state technical personnel.

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[30]U.S. Environmental Protection Agency, "208 Contract Guidance" (Atlanta: U.S. Environmental Protection Agency, Region IV, 1975), pp. 3-13.

EPA Program Guidance Memorandum AM-3 authorized using 208 funds for the purposes of assuring a necessary level of state support. EPA Region IV, in its 208 Planning Process Strategy, stated that

> As experience has been gained, it is evident that the state role should concentrate on technical/analytical support, data development, and certain coordinative activities. Examples of technical support should include quality assurance in the water quality and waste source analysis phase of the 208 Program. The focus of this effort is on standard procedures, methods, and accuracy of lab equipment (including personnel). Also in this component is state participation in the selection of water quality analysis techniques (models); and involvement of major industrial and municipal dischargers in the design of each study. Data development should concentrate on retrieving and evaluating the usefulness of existing data and data collection programs in terms of each study's needs. Ancillary activities include the design of data reporting formats in a fashion compatible with prevailing state and Federal water quality and waste source data systems. Coordinative activities consist of aiding 208 agencies in establishing communication mechanisms, generally committees.[31]

In order to effectuate such an arrangement, states often insist upon a transfer of funds from designated agencies to the state agency as compensation for coordination and other services. This approach has been utilized in most states. A variation of the approach is used in Tennessee, where five 208 agencies jointly pay for the services of consultants approved by the state. This approach

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[31]U.S. Environmental Protection Agency, 208 Planning Process Strategy (Atlanta: U.S. Environmental Protection Agency, Region IV, October, 1975), p. 10-11.

was necessitated by the combination of a freeze on hiring at the state level, and the unavailability of necessary state personnel.

Coordination with State Land-Use Planning

As indicated on Table 7 (page 81), coordination between 208 planning and state land-use planning is important. However, it is not considered as vital as coordination with local and regional planning. This is largely due to the fact that general land-use planning and controls such as zoning have been delegated to local governments. Regional agencies, which are usually responsible to the chief elected officials of local governments, develop plans that can serve as a framework for local planning, though they are not directly implemented. State land-use plans, if adopted, would serve a similar role at a different scale. Whether or not this will occur will depend upon state enabling legislation.

North Carolina state planning. There is a potential for greater relationship between 208 planning and state land-use planning. This is true, for example, in North Carolina, where a State Land-Use Classification System is being developed in conjunction with Coastal Zone Management Planning. This program includes identification and protection of areas of environmental concern, and could be a means of implementing portions of a 208 plan.

Mr. Ron Scott, Land-Use Planning Officer for North Carolina, stated that:

> Requirements of the land classification system will spell out the urbanization process and will lead to a land classification map. As further refinements take place in the land planning process it will modify 208 and the two will fit together; 208 planning cannot exist separately from land-use planning if it is to be realistic and have an impact on the real world.[32]

At the same time, however, Mr. Scott does not see 208 planning as being basically different than other comprehensive planning at the local level in the method of coordination. He sees this as being handled through the Regional Councils, as other programs. Coordination by the state will be largely through the state review process, which is currently a review of how 701 money is spent.

Tennessee state planning. Mr. Niles Schoening, Director of the Tennessee State Planning Office, feels that the most crucial tie-in for 208 planning is at the local level. State planning programs are not expected to affect 208 planning efforts initially, though this may happen later.

Tennessee does not have a comprehensive statewide planning law, and none is expected to pass. However, possible state legislation attacking specific issues such as mountain

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[32]Telephone interview with Ron Scott, State Planning Officer, State of North Carolina.

area development could have an impact on 208 plan implementation.[33]

Virginia state planning. A State Land-Use Council has been established in Virginia, under the Secretary of Commerce and Resources, with staff in the State Planning Division. State roles will include: (1) key facilities; (2) developments of greater than local impact; (3) a policy for the preservation of key agricultural land; and, (4) critical areas.

Coordination of 208 planning with other comprehensive planning will take place through monthly meetings. These meetings will include representatives of the air and water quality programs, the Soil Conservation Service, other state people and, perhaps, the representatives from the Regional Planning and Development Councils (RPDC's).[34]

V. EPA VIEWS OF 208 PLANNING PROCESS

EPA, obviously, has an important role in the 208 planning process. EPA is responsible for the guidelines, for making determinations concerning the designation and grant approval process, and for administering the grants. The role of

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[33]Telephone interview with Mr. Niles Schoening, Director, Tennessee State Planning Office.

[34]Telephone interview with Mr. Charles A. Christopherson, Director, Division of State Planning, State of Virginia.

administering the grants includes setting strategy for the designated agencies to follow in carrying out the planning process.

EPA's assistance to 208 agencies includes the provision of technical assistance; sponsorship of technical meetings and conferences; assistance in cost-price analysis, review- and approval of procurement systems and contracts; provision of audit information concerning consultants with approved indirect cost rates; and many other functions. In addition to such assistance, EPA also holds negotiation sessions with planning agencies prior to approval of a plan-of-study, and must approve the plan-of-study and final plan. As a result, there is a relationship of dependency of areawide 208 staff upon EPA officials. This relationship often extends to the broad area of program interpretation.

Initial Planning Period

The initial planning period provides designated areas with grants that exceed one-million dollars on the average.[35] However, in most areas, this is not expected to provide a detailed evaluation of all water pollution problems. The two-year program is seen as being too short to accomplish

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[35]Centaur Management Consultants, Inc., National Profile, op. cit., p. 35.

this objective.[36] Moreover, the high costs of water quality analysis and monitoring make it virtually impossible to quantify all pollution problems.

In order to develop an acceptable program, designated agencies must set objectives that can be attained in a two-year period. Even after this is done, however, some agencies may need to ask for extensions to their initial planning period. Such extensions may be granted on a case-by-case basis.[37]

The initial two-year study will only provide a "feel" for nonpoint sources.[38] The continuing planning program must be relied on to provide more thorough analysis of the pollution problems within the area.

Continuing Planning Program

The extent of and funding mechanisms for continuing planning are still subject to speculation. One view holds that the continuing planning process will include additional consultant work in order to increase the data base and provide further technical analysis of proposed solutions.[39] However,

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[36]Telephone interview with Eugene Mattis, 208 Project Coordinator, EPA Region III.

[37]Ibid.

[38]Ibid.

[39]Ibid.

this may vary among the 10 EPA regions. Region IV has stressed the need to build in-house capability during the initial two-year period. In fact, the EPA 208 coordinator for Region IV expects that most 208 agencies will not need to assign all present 208 staff full-time to the continuing planning process. Instead, part of the staff could be utilized for other agency functions after the completion of the initial 208 plan.[40]

EPA will probably fund the continuing planning process on a matching basis. The Federal grant will probably be phased out over a period of years. User charges are also a probable source of funding, in accordance with Section 201 of the Act.[41] Such funds would presumably be appropriated to the planning agency by the management system. However, management agency support of the planning process is not expected to begin immediately after the completion of the initial plan.[42] Changing the user fee structure is quite complicated and involves approval from bonding authorities, attorneys, and others.[43] As a result, EPA funding will be crucial in the early stages of the continuing process.

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[40]Interview with Mr. Scott Berdine, 208 Project Coordinator, EPA Region IV.

[41]Ibid.

[42]Interview with Eugene Mattis.

[43]Interview with Scott Berdine.

After the second or third year, though, funds may be available from Federal, local, and even state governments.[44]

Relationships to Other Planning Programs

The 208 program should be integrated into the comprehensive planning process. This could be partially accomplished by assigning former 208 personnel to split their time between the 208 update and other planning functions. Work programs could also be integrated, where possible, so that they might be mutually supporting. Projections developed for HUD 701 programs should be used, as appropriate, for the 208 process. Waste load consequences, identified by 208, could be used to modify land-use projections.[45]

Contributions to other programs. The 208 process has the potential for benefiting other programs in an agency beyond the provision of technical data and evaluation of implementation devices. Personnel who have been involved in the 208 financial management and program management process . . . "can strengthen every other program in the planning agency."[46] They can provide a better feel for quasi-research work and an understanding of technical

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[44]Ibid. State funds could be provided through the State Federal Program or funds could be authorized by the state legislature.

[45]Ibid.

[46]Ibid.

credibility. They will have experience in cost-benefit analysis. Also, the skills that will be learned in dealing with industry and interest groups can benefit the agency.[47]

Other relationships. The 208 program, according to some sources, has brought about national land-use planning. This opinion is based on the fact that 208 planning is required to be performed nationwide, either by a designated agency, or by state agencies in the "nondesignated" areas. The program does involve land use projections, and consideration of land-use controls. However, implementation of land-use controls will continue to be a function of local governments in most cases. And, the objectives of 208 planning are not as broad as general land-use planning.

The 208 program could be the forerunner of similar programs which would address air pollution and solid waste.[48] Legislation for these programs has recently been considered by Congress. And, areawide agencies are being proposed as recipients of the local grants. If such programs should be enacted, regional agencies could develop comprehensive environmental planning programs.

The 208 program also has the potential for increasing public involvement in the planning process. However, it is

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[47] Ibid.

[48] Ibid.

too soon to tell if 208 agencies will effectively integrate views of the general public, interest groups, industry, local public officials, and other agencies into a cohesive and successful plan.

VI. SUMMARY OF THE 208 PLANNING PROCESS

The 208 areawide water quality management planning process is complex. This is the result of the purpose of the program and its relationships with other programs. In order to fulfill the objectives of the program, careful study must be made of existing and projected future water quality; alternative techniques for meeting future water quality goals; and, institutional alternatives for implementing an effective and publicly acceptable plan.

In order to determine what should be done in the future, an adequate inventory is needed of the existing situation and existing data. This information must be analyzed in order to develop a plan-of-study that will take into account existing data and existing institutions in the process of identifying and planning for necessary modifications in the system. Thus, the "Problem Appraisal" is a necessary and essential step in the process.

The planning process consists of two major elements—technical planning and management planning. In the final analysis, they are combined into a single plan. The final

plan must consider the best technical solutions and the best management system for implementing the solutions.

Both the state and the EPA will play vital roles in 208 plan development. The state's role is dictated by its responsibility for statewide planning and certification of the final plan. EPA's role is integral to its position as the funding agency and relates to technical and administrative considerations.

Though 208 planning is initially funded for three years, it involves an annual update. The exact scope and the funding sources for the continuing planning have not yet been agreed upon.

The planning process has implications for local and regional planning, and may be more closely coordinated with state and even national planning in the future.

This chapter has discussed the planning process, interrelationships, and coordinative mechanisms. The following chapter discusses the techniques for implementing 208 areawide water quality management.

CHAPTER IV

ALTERNATIVE IMPLEMENTATION TECHNIQUES

Water Quality Management Planning under Section 208 specifically requires plan implementation. Implementation is required in order to continue to be eligible for Federal grants for wastewater treatment facilities. Chapter IV discusses the basic techniques for implementing the 208 areawide water quality management plan:

1. Facilities construction;
2. Regulatory programs;
3. Financial arrangements and fiscal controls; and,
4. Institutional arrangements.

Construction of wastewater treatment facilities is the typical or traditional method of implementing a water quality control program. Planning for such facilities has considered the extension of sewage collector systems and the sizing and improvement of treatment facilities. In addition, provisions have often been made for collecting, detaining, and sometimes treating stormwater.

Regulatory programs are a means of controlling pollutant discharge. They may be designed to reduce the total discharge and to limit the amount of discharge of specific parameters. Regulatory programs for controlling water pollution have

traditionally concentrated on controlling point sources of pollution. However, some controls may be designed to reduce pollutant loads from nonpoint sources.

Treatment facilities have generally been planned and built by municipalities or special districts to serve discrete urbanized areas. Revenues to construct, operate, and maintain the facilities have depended upon various sources, including Federal and state grants, bonds, various taxes, and user charges. Selection of revenue sources and establishment of taxes and user charges have often been based upon the availability of funds, the ease of collection and, to some extent, the relationship between the costs and benefits. Typically, charges have not been selected as a means of limiting discharges.

Financial arrangements as required by the Act are designed as necessary means of providing funds for treatment facilities and management systems. However, their required characteristics also serve other functions related to equity of costs and benefits and, to some degree, help to limit discharges.

Institutional arrangements are the organization of individual implementing agencies. They include the overall management or coordination of the areawide management system. The design of the institutional arrangements is extremely important. First, adequate authority must exist for carrying out the provisions of the Act in regard to regulating

discharges; establishing, operating and maintaining treatment facilities; and, establishing user charge systems that meet the requirements of the Act.

I. FACILITIES CONSTRUCTION

One obvious means of implementing a water quality management plan is by constructing wastewater treatment facilities. Section 303(e) basin planning identifies facilities planning needs. Section 404 requires that facilities be constructed according to a specified schedule in order that a discharger be permitted to discharge pollutants into the nation's waters.

The Act requires that all publicly-owned treatment facilities must have at least secondary treatment (biological processes that remove up to 90 percent of the organic matter in sewage) by July 1977. They are also required to upgrade to the average of best advanced treatment systems by July 1983. Industries which have wastewater discharges are also required to meet 1977 and 1983 goals of best available technology (1977) and best economically achievable technology (1983).

The 201 program provides 75 percent Federal grants for planning, engineering, and constructing publicly-owned wastewater treatment facilities. As related in Chapter II, the 201 program is a chief means of implementing the 208 areawide water quality management plan.

Construction of facilities will be an important means of solving wastewater treatment and stormwater runoff problems. However, the Act requires that implementation techniques be considered that are most cost-effective. The intent is to minimize the construction of costly advanced waste treatment systems, while still meeting the water quality goals established by the Act.

II. REGULATORY PROGRAMS

Modern societies have many laws and regulations. Among these are laws and regulations which are designed to protect the natural environment. These include regulatory controls for both point and nonpoint sources of water pollution.

Point source controls include Federal and state regulatory programs which limit the types and amounts of pollutants that may be discharged by a municipality or industry. Nonpoint source controls include land-use controls and regulations which require "best management practices" (BMP).

Areawide water quality management plans are required to establish a regulatory program to:

1. implement an areawide waste treatment management plan to provide control or treatment of all point and nonpoint sources of pollution;
2. regulate the location, modification, and construction of any facilities in the 208 planning

area which may result in wastewater discharge in the 208 planning area; and,

3. make certain that all commercial and industrial wastes discharged to any publicly-owned treatment plant in the area meet the applicable pretreatment requirements.[1]

Point Source Controls

The National Pollutant Discharge Elimination System (NPDES) permit program established by Section 402 of the Act, and its associated monitoring and pretreatment requirements, will be an important device for regulating point source discharges.[2] This was recognized by the 208 planners surveyed who indicated their beliefs that point source controls would be important or very important in implementing their 208 plans.

The permit system is basic to point source regulation. The permit establishes a legal requirement to meet specified discharge limits. It requires specific control measures to be taken by a specified date.

Table 9 lists the types of point source controls which are in effect in North Carolina. The state legislation has been to bring the state's enforcement mechanisms into line

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[1]Responses to questionnaires.

[2]Ibid.

TABLE 9

NORTH CAROLINA STATE LEGISLATION AND REGULATIONS AFFECTING POINT SOURCES OF WATER POLLUTION

Types of Power	Legislation	Date
(Statutory powers over water pollution affecting sources of domestic water supply)		1899
Stream classifications	State Stream Sanitation Act	1951
Classification of major streams	Water and Air Resources Act	1967
Pollution abatement plans	Amendments	1971
Effluent limitations	Amendments	1973
Enforcement of classifications	Amendments	1975

Source: 208 Inventory of Existing Resources (Research Triangle Park, North Carolina: Triangle J Council of Governments, 1976), p. V.A.8.

with the Federal standards, particularly the Federal Water Pollution Control Act Amendments of 1972. North Carolina was granted NPDES permit authority in October 1975. Whether administered by a state or by EPA, the "402" permit is the dominant method of regulating point source discharges.

In addition to the "402" NPDES permit, the "404" permit is also of significance; Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers to ". . . issue permits, after notice and opportunity for public hearings for the discharge of dredged or fill material into the navigable waters at specified disposal sites."[3]

A court decision extended the definition of "navigable waters" to include all streams and wetland areas. As a result, the "404" permit has been used effectively to prohibit pollution in the nation's wetlands (swamps, marshes, lagoons, estuaries, etc.). However, Congress is considering an amendment to The Act which would restrict the jurisdiction of the Corps of Engineers "404" permit authority to a much smaller area. If this should occur, some environmental groups assert, it would be possible to indiscriminately pollute many of the wetland areas that support a wide range of aquatic life and provide sanctuaries for waterfowl and

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[3]Public Law 92-500.

other types of wildlife. The fate of the so-called Breaux Amendment is not yet clear, since the Senate bill for amending the Act does not contain a similar provision.

Nonpoint Source Controls

There are numerous types of nonpoint source controls, including land use controls and "Best Management Practices" (BMP). These regulations, controls, and suggested practices are administered by a wide variety of governments and agencies. Thus, the 208 management system may be expected to include agreements for coordination among "agencies which administer licensing programs or management practices related to nonpoint source pollution."[4]

Table 10 summarizes North Carolina legislation affecting nonpoint source pollution control. As the table indicates, state agencies have authority concerning sedimentation, pesticides, mining, and solid waste. These are typical of regulatory powers exercised by other states to control nonpoint sources of water pollution.

The Sedimentation Pollution Control Act gives the Department of Natural and Economic Resources authority to control erosion and stream sedimentation resulting from land

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[4]U.S. Environmental Protection Agency, Draft Guidelines, p. 72.

TABLE 10

NORTH CAROLINA STATE REGULATIONS AND LEGISLATION AFFECTING NONPOINT SOURCES OF WATER POLLUTION

Agency/Authority	Legislation	Date
DNER	Sedimentation Pollution Control Act	1973
EMC/permit	Oil Pollution Control Act	1973
N.C. Pesticide Board	Pesticide Law	1971
DNER	Mining Act	1971
Department of Human Resources	Solid Waste Program	1971

Source: 208 Inventory of Existing Resources (Research Triangle Park, North Carolina: Triangle J Council of Governments, 1976), pp. V.A.4-V.A.8.

disturbing activities (with the exceptions of agricultural, silvicultural, and mining activities. This Act requires:

> . . . the filing of erosion and sedimentation control plans, design standards for control measures and structures, and downstream protection from the erosive effects of stormwater runoff. Statutory standards that must be complied with during land-disturbing activity include the creation of a buffer zone to contain siltation, angle requirements for graded slopes, and the provision of ground cover to contain erosion. Local sedimentation and erosion control programs may be established with the approval of the Sedimentation Control Commission if requirements are at least as stringent as the state's; when a local program has been approved, permits and erosion control plans are required for land-disturbing activity.[5]

The Oil Pollution Control Act prohibits discharge of oil without a permit from the Environmental Management Commission. Dischargers are required to notify the EMC. They are liable for clean-up and restorative measures.

The Pesticide Law authorizes the North Carolina Pesticide Board to regulate (in conjunction with the Commissioner of Agriculture) the sale and use of pesticides. The major regulatory tools established by the law are:

1. registration of pesticides;
2. imposition of conditions on use of restricted use pesticides; and,
3. regulation of application methods.

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[5] Triangle J Council of Governments, 208 Inventory of Existing Resources (Research Triangle Park, N.C.: Triangle J Council of Governments, 1976), p. V.A.4.

The Mining Act established a program to control runoff from surface mining. The permits, issued by DNER, "are contingent upon affected areas and the protection of natural resources and the posting of an appropriate bond."[6]

The Department of Human Resources has authority to establish a solid waste program on a statewide basis. The program includes research, investigations, surveys, and inspections.[7] Collection and disposal of solid waste is a municipal or county function.

Septic tank regulation is also a function of state and local governments. North Carolina law divides regulatory authority for septic tanks between the Environmental Management Commission and the Commission for health services.

> . . . Systems with less than 3000 gallons design capacity, the effluent of which does not discharge into surface waters, are approved under regulations promulgated by the Commission for Health Services; those with capacity greater than 3000 gallons, or which result in a discharge to surface waters, are approved according to Environmental Management Commission rules . . . single family systems with less than 1000 gallons capacity are to be approved by local health department under Environmental Management Commission Guidelines.[8]

Land-use controls. Land-use controls can be a means of regulating nonpoint sources. The 208 agencies contacted

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[6]Ibid., p. V.A.5.

[7]Ibid., p. V.B.31.

[8]Ibid., p. V.B.39.

indicated that some land-use controls would be "very beneficial" in dealing with nonpoint pollution. However, in many cases, new legislation may be necessary to give the counties the authority to administer building and housing permits and other land-use controls which may currently be limited to municipalities. The authority to administer codes and permits could give counties authority over some of the activities which cause nonpoint source pollution. Construction permits may also be useful in this regard and could be administered by municipalities, counties, or other agencies. The 208 management system may include agreements for coordination among "agencies which administer licensing programs or management practices related to nonpoint source pollution."[9]

Local jurisdictions have traditionally been delegated authority to implement the principal land-use measures such as zoning, building codes, and subdivision regulations.[10] In some cases, counties have not been delegated the same authority as municipalities have to enforce land-use controls based on the police power of the state. This is true in Tennessee, where only a few counties have the authority to enforce building codes. Nevertheless, the 208 agencies

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[9]U.S. Environmental Protection Agency, Draft Guidelines, p. 7-2.

[10]Ibid.

which responded to the questionnaire indicated a belief in the importance of land-use controls in implementing a 208 plan.

Because none of the 208 plans has been completed and approved, nothing definitive can be said yet about the importance of particular land-use controls. Such analysis would require an evaluation of whatever controls are implemented—after enough time has elapsed for them to have some effect. However, Table 11 gives a rough indication of how 208 planners who responded to a questionnaire see the anticipated effectiveness of particular controls.

It is interesting to note that zoning and subdivision regulations—the most common land-use controls employed by planners—were not the highest-ranked of the 19 possible types of controls considered. Rather, there were five controls which were generally more highly regarded for limiting nonpoint sources:

1. Construction permits;
2. Development permits;
3. Grading regulations;
4. Hillside regulations; and,
5. Land conservation policies.

Construction permits are an administrative means of ensuring that the quality of new construction will meet certain minimum standards. Standards applied to construction may consider the location and method of construction.

TABLE 11

RESPONSES TO QUESTIONNAIRE CONCERNING EFFECTIVENESS OF LAND-USE CONTROL IN LIMITING NONPOINT SOURCES

Type of Regulation or Control	Anticipated Effectiveness in Limiting Nonpoint Sources of Pollution		
	Very Beneficial	Somewhat Beneficial	Little or No Effect
Construction Permits	4	2	-
Development Permits	4	2	-
Grading Regulations	4	2	-
Hillside Development Regulations	4	2	-
Land Conservation Policies	2	4	-
Subdivision Regulations	2	3	1
Zoning	1	5	-
Discharge Permits	2	2	2
Flood Plain Zoning and Regulation	1	4	1
Public Works Policies	2	2	2
Buffer Zones	1	3	2
Conservation and Scenic Easement	-	5	1
Building Codes	1	3	2
Environmental Performance Zoning	-	4	2
Public Investment Policies	-	4	2
Transferable Development Rights	-	5	*
Density Bonuses	-	3	3
Taxation Policies	-	2½**	3½**
Housing Codes	-	1	5

*One agency expected a somewhat detrimental effect.

**One agency said "somewhat too little, or no."

Source: Responses to 208 Agency Questionnaire.

Controls may include provisions concerning grading, tree removal and soil disturbance. Appropriate controls can help minimize erosion and resulting sedimentation. Effective administration of construction permit systems can, thus, help reduce nonpoint sources of water pollution. This particular control probably owes its ranking largely to the fact that it can deal directly with the problems which it is intended to address and does not require extensive planning of land-use development patterns.

Development permits are somewhat similar to construction permits. However, they deal with developments that often include more than one unit. The design of the overall development and the proximity and relationship of individual units may be covered by a development permit.

Grading regulations are very specific controls with obvious relevance to the control of erosion-sedimentation and runoff. Land conservation policies are a much broader type of instrument. However, they have obvious relevance to controlling erosion-sedimentation, runoff, flooding, and pollution of ground water.

None of the above regulations or controls is as far-reaching as zoning. That is, unlike zoning, they do not control the use to which land may be put. Rather, they are oriented toward how land should be developed, or what land should be conserved. Implementation of these controls would allow development in all areas, except those which are set

aside for conservation purposes. But, the process of development would be regulated for the purpose of preventing harmful effects. Thus, these controls are seen as dealing directly and effectively with possible causes of certain forms of water pollution such as erosion and sedimentation. Most of these controls could be helpful in any area. Hillside regulations would, obviously, not be useful in areas where the land is flat. However, where there are hills or mountains, problems such as erosion and sedimentation can be intensified because of the topography. Thus, special regulations may be called for to regulate the way in which steep areas are developed.

Subdivision regulations also control the way in which development takes place. Subdivision regulations which are carefully written, and properly enforced, can help prevent such problems as improper stormwater drainage, inadequate stormwater and sanitary sewerage facilities, and erosion and sedimentation.

Zoning is the traditional method for controlling urban development. It is based upon the premise that it is possible . . . "by careful intellectual effort, to determine optimum land-use long before actual development, by establishment of use and bulk regulations applicable to

preset districts."[11] Zoning presents a method of dealing with potential nonpoint source problems through controlling densities and locations of various polluters and through restrictions on lots using septic tanks, and so forth. While zoning can be an effective tool for controlling pollution, it has its limitations:

> Zoning is increasingly under attack as a form of unnecessarily rigid regulation rooted in outmoded tradition and inhibiting desirable change and experimentation. . . .[12]
>
> Viewed substantively, it is a rare ordinance indeed that does not commit greatly excessive land areas to commercial or industrial use, thereby ensuring that the land so classified will not be used for much of anything or that in the spotty development that does result large sections of the community will be permanently blighted, . . .[13]

Zoning is generally not in practice outside of cities, except in very urbanized counties. There is a resistance to rigid land-use controls in most rural areas. As a result, zoning may not be as feasible as other regulations and controls in areas which have scattered nonpoint source problems, or where continuing development may cause such problems. In addition, even where it is put into practice,

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[11] Johnson, Constitutional Law and Community Planning, 20 Law & Contemp. Prob. 199 (1955) in Robert H. Freilich and Peter S. Levi Model Subdivision Regulations Text and Commentary (Chicago: American Society of Planning Officials, 1975), p. 14.

[12] Fred H. Blair, Jr., and Ernest R. Bartley, The Text of a Model Zoning Ordinance with Commentary (Chicago: American Society of Planning Officials, Third Edition, 1966), p. 2.

[13] Ibid., p. 3.

zoning could fail to solve problems, or even compound the problems unless it is based upon a carefully conceived plan that is in turn based upon realistic estimates of future needs for commercial and industrial acreage. Blair and Bartley contend that such shortcomings can be overcome by taking advantage of the flexibility that zoning can offer.[14]

Other controls which were expected to be "very beneficial" by at least one of the respondents were:

1. Discharge permits;
2. Flood plain zones;
3. Public works policies; and,
4. Buffer zones.

Discharge permits have typically been used in the past to control point sources. However, use of such permits may also be feasible for large area developments, shopping centers; and large agricultural, silvicultural and mining areas to control runoff. Flood plain zoning and regulation can help reduce nonpoint pollution by prohibiting nonpoint sources from locating in the flood way. Public works policies can be used to ensure that public works projects do not cause nonpoint pollution; and construction of nonpoint controls can be included in the scheduled public works projects. Buffer zones can be established between possible nonpoint sources and streams or aquifers.

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[14]Ibid., p. 2.

Other controls considered were:

1. Conservation and scenic easements;
2. Building codes;
3. Environmental performance zoning;
4. Public investment policies;
5. Transferable development rights;
6. Density bonuses;
7. Taxation policies; and
8. Housing codes.

Building codes apply to location and maintenance of buildings and structures and appurtenances, as well as to their construction, alteration, equipment, use and occupancy.[15] Proper enforcement of building codes can help ensure that buildings, structures, and so forth, are not constructed in such a manner as to be nonpoint sources of pollution. Conservation and scenic easements could be used to protect waterways and aquifers from development and, thus, from pollution.

Environmental performance zoning, surprisingly, was not highly ranked by the results of the questionnaire. Possibly this method is considered cumbersome and it may be generally associated with controlling problems of air pollution and noise pollution. However, it could prove to

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[15] The National Building Code (New York: National Board of Fire Underwriters, 1955), p. 1.

be a useful method for controlling the nonpoint pollution effects of agricultural feedlots, quarries, and many other types of users.

Public investment policies could be used to ensure that public investments take into account the direct effects of public facilities on water quality, as well as the indirect effects associated with influencing development patterns in an area.

Transferable development rights may be used as a means of protecting environmentally sensitive areas, while granting developers rights to build at greater densities where the effects of the development are not as great, or can be more successfully controlled. Density bonuses could also be useful by encouraging clustered development, thereby possibly increasing the "sewerability" of areas that might otherwise be developed in a more scattered fashion with septic tanks. Taxation policies can be devised so that they properly account for the external costs of various types of land uses. Housing codes are perhaps only marginally useful in preventing water pollution, though their potential has perhaps not been fully explored.

Four of the respondents to the questionnaire elaborated on how they felt land-use planning and various controls and regulations could be used in controlling sources of water pollution. One stated that: "To the extent that there is a relationship between land use and water quality, zoning

ordinances and other regulatory measures which influence the spatial distribution of land uses and the intensity of development will affect water quality." Comments from three others were:

1. "We consider the nonpoint problems to be related directly to sediment in our area. Perhaps the changing of land-use from one type to another could be considered as having a two-fold effect or impact on water quality. First impact would be during construction. This may be the most severe. Second, the long-term impact of the changed land-use on water quality (this nonpoint pollution may very well be caused by parameters other than just sediment."

2. Urban and rural areas with potential point/nonpoint problems should be subjected to controlled development. Those areas with present problems should (be) analyzed, corrective measures taken and preventive measures adapted."

3. "It's . . . too early to tell. If we had the answer to this question now we would be well along in solving our problems."

III. FINANCIAL ARRANGEMENTS AND FISCAL CONTROLS

Pricing policies of agencies that provide wastewater treatment and taxation policies of local and state governments are two additional considerations in 208 plan implementation.

They should be considered as means of augmenting the required regulatory program.[16]

Traditional methods of financing wastewater treatment include: (1) general obligation bonds; (2) revenue bonds; (3) property tax revenues; and, (4) grants-in-aid.[17] Some of the possible financing methods conform more than others to the characteristics of a good revenue program, as identified by Adam Smith: (1) an equitable tax; (2) certain, not arbitrary; (3) convenient; and, (4) economical to collect—and those other characteristics also favored by other economists, such as: (5) productivity or adequacy; (6) taxation according to benefit received; (7) ability to pay; and, (8) social expediency.[18]

Several principles have been identified for determining the equity of methods of public financing. The concept of horizontal equity may be stated as "equals should be treated equally." Vertical equity means that "persons of differential taxpaying circumstances or abilities should pay different amounts of tax." Other concepts related to equity

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[16]U.S. Environmental Protection Agency, Draft Guidelines, p. 7-2.

[17]Richard L. Brunton and Jeptha J. Carrell, Management Practices for Smaller Cities, first edition (Chicago: The International City Manager's Association, 1959), pp. 277-279.

[18]Jewell Cass Phillips, Municipal Government and Administration in America (New York: The Macmillan Company, 1960), pp. 423-424.

are: (1) equal sacrifice; (2) proportional sacrifice; and, (3) minimum aggregate sacrifice. In addition to these principles, which are related to the ability to pay, there is also the benefit principle. This is based upon the idea that payments should be based upon marginal benefits.[19]

A fair method of financing wastewater treatment services is quite important. Governments cannot efficiently "give away" services for which the demand is relatively elastic. This is an important principle of public finance. Attempts to provide services "free" to the users by financing them out of general revenues would result in either "a serious shortage or congestion, or relatively too many resources will be devoted to the supply."[20]

The use of a general property tax, which is a somewhat regressive tax (i.e., it puts a somewhat greater burden on those less able to pay, than those more able to pay) to finance sewer services is contrary to several principles of taxation.[21] First, as a regressive tax, it does not fulfill the ideals of horizontal and vertical equity. Second, it is

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[19]Bernard P. Herber, Modern Public Finance, revised edition (Homewood, Illinois: Richard D. Irwin, Inc., 1971), pp. 117-123.

[20]John M. Buchanan and Marilyn R. Flowers, The Public Finances: An Introductory Textbook, fourth edition (1975), p. 481.

[21]Branton and Carrell, Management Practices for Smaller Cities, op. cit., p. 94.

not based upon benefit received. And, third, it is not efficient, since use of sewer service is not necessarily proportionate to taxable property value. As a result, potential users may be encouraged to use public sewerage services or discouraged from using these services, based upon the relationship between the sewer tax on their property and the benefit received, rather than based upon the need for such waste treatment. Or, if sewer hook-up is required by law, the cost to users may not be equitable since use and tax may not be proportionate.

A problem with the sewer charge, however, is how to implement a fair charge. Sewer charges are often based upon water usage. This is done because it is practical to meter water usage, but not as practical to meter sewer usage.

The requirements of Public Law 92.500 are designed to overcome inequities and to ensure that sewage treatment services are used by all who need the service, so far as this is cost-effective compared to individual treatment. At the same time, The Act establishes fiscal controls as a means of augmenting the required regulatory program.

Financial Requirements

The 208 plan must include financial arrangements for its implementation. The plan should not include proposals which are beyond the capacity of the implementing agencies to carry out, either from a legal or financial standpoint.

Financial considerations include raising revenues for operational costs, and financing indirect costs.

The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) contain various provisions which constitute direct or indirect requirements for the financial arrangements for implementing a 208 plan. Title II contains those provisions which directly affect 208 areawide waste treatment management. The other provisions are dispersed throughout the Act.

Capital construction costs. The 208 plan must identify ways of financing the construction costs during the period of plan implementation. This includes traditional treatment works for treatment of point sources of water pollution, as well as means of dealing with nonpoint sources.

Any applicant who proposes to construct treatment works must agree "to pay the non-Federal costs of such work."[22] The applicant must also agree to pay "the construction, operation and maintenance of the treatment works"[23] in its jurisdiction. Among other requirements, one of particular significance is:

> . . . the Administrator shall not approve any grant for any treatment works unless the applicant has made provisions for industrial cost recovery (the

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[22]U.S. Environmental Protection Agency, Draft Guidelines, p. 9-2.

[23]Ibid.

> recovery from industrial users of the treatment works of that portion of the cost of construction of such treatment works which is allocable to the treatment of such industrial waste to the extent attributable to the Federal share of the cost of construction).[24]

Operational costs. Waste treatment management agencies are required by Section 208(c)(2)(E) to "have adequate authority to raise revenues, including the assessment of waste treatment charges, to implement all elements of the plan."[25] The management agency must have authority to assure that each participating community will pay a proportionate share of the treatment costs; and, a system of user charges must be adopted that will assure "that each recipient of waste treatment services will pay its proportionate share of the cost of operation and maintenance (including replacement) of any waste treatment services provided by the applicant"[26] for any Federal grant.

Indirect costs. Revenues from treatment facilities should be designed to cover indirect costs including:

1. the ongoing planning process;

2. processes to identify and/or control nonpoint sources of pollution; and,

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[24] Ibid.

[25] Ibid., p. 9-3.

[26] Ibid.

3. financing of other environmental improvement programs.

Alternative Financial Arrangements

Possible alternative means of financing water and sewer facilities may vary from one area to another. However, the following analyses of alternatives identified by the Triangle J Regional Council and Fifth Planning District Commission describe the present alternatives available to agencies in North Carolina and Virginia, respectively. The Triangle J study separately identifies financing arrangements for water and sewer main extensions and those generally available to organizations which can provide water and sewerage treatment services.

Arrangements for financing extensions. The Triangle J 208 study has determined that sources of revenue to finance water and sewer main extensions may be divided into five classes:

1. Local taxes
2. Rates
3. Payments from property
4. Special service charges
5. State and Federal grants.[27]

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[27] 208 Inventory of Existing Resources, op. cit., p. V.C.21.

Local taxes have played an important role in financing water and sewer extensions in some localities. However, local taxes are now considered the least important of the means for financing these extensions. In addition, the official policy of the American Water Works Association is that water utilities should finance such costs from revenues derived from user charges.[28] This view is consistent with the principles of taxation discussed previously. Many county officials in North Carolina, however, accept the argument that the services are of a general benefit to the entire community, being essential to community health and industrial and economic growth, and therefore should be supported by general taxes.[29]

Financing of extensions from user revenues, or rates . . . "is still the dominant approach in the state's smaller water and sewerage systems."[30] It is expected to remain so, particularly among cities of less than 10,000 population. The smaller the city, the more likely is this method to be used. In addition, many cities that attempt to make the assessment for extensions upon the basis of benefit received often use rates to finance a share of the extension costs.[31]

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[28]Ibid., pp. V.C.22 and V.C.21.

[29]Ibid., p. V.C.22.

[30]Ibid., p. V.C.23.

[31]Ibid., p. V.C.24.

However, there is a slow trend toward matching benefits received with charges for sewer extensions.[32] This is in accordance with the principles of "taxation according to benefit received" and "equitable taxes."

Payments from property include: (a) special assessments; (b) subdivision requirements; (c) payments in advance; (d) acreage charges; (e) special connection charges; and (f) reimbursement agreements. These payments have become popular in North Carolina (especially in the large and rapidly-growing cities) since the end of World War II. They became popular as an alternative to heavy borrowing to meet the costs of frequent extensions necessary to keep pace with rapid (and often scattered) development.[33]

Special assessments are charges made to abutting property to recover all or part of the costs of water or sewer extensions or other improvements. Assessments in North Carolina can be based on frontage, total area of the lot, number of lots, the value of the improvement to the land, or a combination of these factors.[34] Such charges are attempts to equate costs with benefits received.

From an administrative viewpoint, requiring developers of subdivisions to install water and sewer lines according

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[32]Ibid., p. V.C.23.

[33]Ibid., p. V.C.24.

[34]Ibid.

to specified standards, is possibly the simplest way for a city or county to charge benefited property. The local government will often pay the difference in costs for extra capacity which is or will be needed, but is not necessary to serve the particular subdivision:

> The individuals who purchase property in the subdivision pay their share of the cost of the water and sewer lines as a part of the cost of the improved property they acquire. Many students believe that this is the most equitable way to distribute the cost of utilities—more equitable than frontage, and assessment based on acreage, or any other particular factor.
>
> A majority of the cities with populations over 300 require water and sewer lines in new subdivisions, and most of those over 10,000 in population require that these lines be installed at the developer's expense. Other cities, except for a few that meet the costs from general system revenues, share the cost with the developer.[35]

Advance payments are similar to special assessments, except that the local water or sewer authority does not have to finance construction before being paid by those who benefit. As a result, improvements can be undertaken sooner where property owners have sufficient cash. The feasibility of this approach is limited to areas where property owners have accumulated savings or can easily borrow to pay their share of the costs.

Acreage charges are designed to cover the costs of major trunk lines. They are collected at the time of

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[35]Ibid., p. V.C.25.

connection on a uniform basis.[36] To the extent that they make allowances for development or nondevelopment, they can approach the principle of equity.

Special connection charges, or privilege connection charges, are usually based upon an area factor, such as frontage. They are similar to special assessments, but are only applied to developed property where connections are made. As a result, the special connection charge is often considered more acceptable than a special assessment.[37]

Reimbursement agreements are often used in conjunction with extension policies in order to repay a customer for the excess capacity of a line that is extended. Such agreements facilitate early extension of lines and help spread the cost of major facilities equitably among users.

Financing methods for water and sewerage treatment facilities. The Triangle J and Roanoke 208 studies have both studied financing arrangements available to potential or existing water and sewerage treatment agencies. The Knoxville-Knox County 208 study has analyzed the financial mechanisms utilized by existing agencies. Other 208 agencies included in this study have not yet completed their analyses

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[36]Ibid., p. V.C.26.

[37]Ibid., pp. V.C.26 and V.C.27.

of institutional and fiscal arrangements. Summaries of the three available studies are presented in Tables 12, 13 and 14.

The study of possible North Carolina institutional arrangements done by Triangle J COG (Table 12) indicates that City or County systems, an Interlocal Contract, or a County Service District are the most flexible arrangements for financing water and sewerage services. The next best arrangements from a financial standpoint are the Sanitary District and Metropolitan Sewerage District or Metropolitan Water District. The Water and Sewer Authority and Joint Management Agency arrangements are the least flexible for providing adequate financing.

The Knoxville study (Table 13) indicates that local governments can provide better financing than independent utility districts. The study done by The Fifth Planning District Commission of Virginia did not compare city and county arrangements, only regional options (see Table 14). This analysis indicates that, from the financing standpoint, a "mixed alternative" is the best approach to financing sewerage services in Virginia. The Service District concept appears to be the best single approach. Three other approaches (Sanitary District, Water and Sewer Authority, and Multi-Jurisdictional Service Contracts) appear to be roughly equal in financing capability. Sanitation Districts have fewer financing options than the other approaches.

TABLE 12

FINANCING METHODS FOR SEWERAGE SERVICES IN NORTH CAROLINA

Financing Methods	Institutional Arrangements						
	City or County	Interlocal Contract	Joint Management Agency	County Service District	Sanitary District	Water and Sewer Authority	Metropolitan Sewerage District
Contract with Local Governments	+	+	+	+(1)	+	+	+
State and Federal Grants	+	+	+	+(1)	+	+	+
Revenue Bonds	+	+(2)	-	+(1)	+	+	+
Rates and Charges	+	+	+	+(1)	+	+	+
Property Taxes	+	+(2)	-	+(1)	+	-	+
General Obligation Bonds	+	+(2)	-	+(1)	+	-	+
Special Assessment	+	+(2)	-	+(1)	-	-	-
Require Developer to Install Sewers in New Subdivisions	+	+(2)	-	+(1)	-	-	-

Legend: + indicates institution has the specified authority.
- indicates institution does not have the specified authority.
(1) County acts for CSD
(2) Local governments can perform these functions individually.

Source: Triangle J Council of Governments, 208 Inventory of Existing Resources (Research Triangle Park, N.C.: Triangle J Council of Governments).

TABLE 13

FINANCING METHODS FOR SEWERAGE SERVICES IN KNOX COUNTY, TENNESSEE

Financing Methods	Institutional Arrangements		
	City	Utility Districts	County
Revenue Bonds	+(1)	+	(2)
General Obligation Bonds	+(1)	-	(2)
Fees	+	+	(2)
General Tax Funds	+	-	(2)

Legend: + indicates institution has the specified authority.
- indicates institution does not have specified authority.
(1) City may issue special revenue-general obligation bonds. The combination bond has a low interest rate.
(2) It is unclear from the study which methods of financing can be used by Knox County. However, it can probably be assumed that Tennessee counties in general could utilize any of these methods of financing water and sewerage services.

Source: Knoxville-Knox County Metropolitan Planning Commission, Executive Summary Management Plan Profile Report Agency Descriptions and Problem Analysis. 208 Areawide Menagement Plan (Knoxville: Knoxville-Knox County Metropolitan Plamming Commission, May, 1976), pp. 5-20.

TABLE 14

FINANCING METHODS FOR SEWERAGE SERVICES IN VIRGINIA

Financing Methods	Institutional Arrangements					
	Sanitary District	Service District	Water and Sewer Authorities	Sanitation Districts	Multi-Jurisdictional Service Contracts	Mixed Alternative
Service Charges	+	-	+	?	+	+(1)
Annual Property Tax	+	-	-	-	-	+(1)
General Obligation Bonds	+	-	-	-	+	+(1)
Revenue Bonds	+(2)	+(3)	+	+	+	+(1)
Gifts	-	+	-	-	+	+(1)
Grants	-	+	-	-	-	+
Assessment on Governmental Subdivisions	-	+	-	-	-	+(1)
Rents and Fees	-	+	-	+	-	+(1)
Contracting for Services	-	-	+	-	-	+(1)
Borrowing	-	-	+	-	+	+(1)

TABLE 14 (continued)

Legend: + indicates institution has the specified authority.
- indicates institution does not have the specified authority.
(1) Whether or not the "mixed alternative" has the authorities indicated depends upon the particular types of institutions included in the mix.
(2) A Sanitary District can issue revenue bonds if general obligation bonds prove insufficient for financing.

Source: 208 Areawide Wastewater Management Plan. Draft Part VI. Water Quality Management Alternatives, Sections II and III (Roanoke, Virginia: Fifth Planning District Commission and Moore, Gardner & Associates, Inc., August 11, 1974), pp. 1-22.

Possible arrangements vary from one state to another and the most feasible arrangements may vary within the same state from one substate district to another. Any arrangement that can provide for service charges, based upon cost of providing service to user, can issue revenue bonds to finance construction, and is eligible to receive state and Federal grants has the potential of being a financially feasible arrangement and one that can ensure equity among users. However, such arrangements must also be scrutinized in regard to ability to provide services at a reasonable rate, and ability to finance expansions.

The 208 study being done by the Knoxville-Knox County (Tennessee) Metropolitan Planning Commission analyzed the financial status and fiscal mechanisms of existing water and sewerage institutions in the county. The analysis concerned: (1) capital funding; (2) ability to secure other local financial resources, such as Federal Revenue Sharing Funds and general tax revenues; (3) operating costs; (4) rate structure; (5) accounting procedures; and, (6) financing the expansion of services. The analysis led to eight major findings, which can be summarized as four which are: First, funding for capital improvements at costs the utility customers are willing to bear is a major problem. The smaller utility districts in the county have severe financing limitations. Second, the cost of providing utility service, particularly wastewater collection and treatment, is higher

in the county utility districts than in the city. County residents' utility charges are generally higher. Third, the rate structures of the utility agencies should be re-evaluated for equity and conformance with water quality goals. And, fourth, the utility districts which are not now providing wastewater service may not be able to finance the expansions necessitated by future population growth.[38]

Other Financial Activities of "208" Study

In addition to considering financial requirements and alternative financial arrangements, other financial activities to be considered in a 208 plan are:

1. A 20-year projection of financial arrangements to provide the treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of the area over the 20-year period.

2. A more detailed five-year projection including capital improvement budgeting and cash flow.

3. Legal opinions concerning the financial arrangements.

4. The financial capability of the implementing agency.

5. The method for obtaining electoral approval or legislative approval of financial arrangements where necessary.

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[38]Knoxville-Knox County Metropolitan Planning Commission. Management Plan Profile Report, Agency Descriptions and Problem Analysis, Knoxville-Knox County 208 Areawide Water Quality Management Plan, May, 1976, pp. V-8 to V-17.

6. Financial arrangements designated to regulate the amounts or types of discharges.

These are basic outputs required by the 208 planning process.

IV. INSTITUTIONAL ARRANGEMENTS

Institutional arrangements are those arrangements required to provide a management system, to enforce regulations, controls and fiscal and financial arrangements. In order to assure an effective management system, institutional arrangements should be designed to provide for (1) planning; (2) organization; (3) direction; (4) administrative control; and, (5) personnel, financial and legal procedures. These are the elements of the management process.[39]

In order to have the ability to effectively carry out the requirements of a management system, institutional arrangements must have the necessary legal authority; administrative authority; financial mechanisms; and, technically trained staff, in sufficient numbers and attitudes consistent with the premises of the systems approach.[40]

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[39] The Techniques of Municipal Administration, fourth edition (Chicago: The International City Manager's Association, 1958), pp. 9-13.

[40] David C. Ranney, Water Quality Management: An Analysis of Institutional Patterns (Madison, Wisconsin: The Water Resources Center, University of Wisconsin, 1972), pp. 114, 131.

In addition, institutional arrangements for sewerage disposal are often more effective on an areawide basis than when a larger number of independent governmental jurisdictions provide these services within a metropolitan area. Provisions of services by a multitude of agencies generally results in a more "inequitable and difficult process of financing these services which, by their nature, are areawide in character."[41]

Many people accept the idea that ". . . the sewage treatment facilities of metropolitan communities must be coordinated and administered on an areawide basis."[42] However, "they do not at the same time propose that operation of facilities needs to be the responsibility of an areawide government, or that planning and policies of both water supply and sewage disposal need to be handled by the same areawide agency."[43]

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[41]M. B. McPherson, Prospects for Metropolitan Water Management (New York: Urban Water Resources Council, December, 1970), p. 3-17. Also see: Advisory Commission on Intergovernmental Relations, Governmental Structure, Organization, and Planning in Metropolitan Areas (Washington, D.C.: U.S. Government Printing Office, 1961).

[42]Advisory Commission on Intergovernmental Relations, Metropolitan Councils of Governments, Report M-32 (Washington, D.C.: Advisory Commission on Intergovernmental Relations, 1966), p. 9-10.

[43]U.S. Bureau of the Census, Governmental Organization, Vol. 1, 1967 Census of Governments (Washington, D.C.: U.S. Government Printing Office, May, 1968).

Requirements of Areawide Management System

The 208 plan must recommend institutional arrangements for implementation of the plan. This must include arrangements for continuing planning as well as for a management system. In some cases, existing institutions may be utilized. In other cases, however, new arrangements may be needed to—

> . . . relate existing governments of various types to the areawide management agency or agencies . . . the system should be realistic and a logical outgrowth of the institutional situation existing at the time planning for the area begins.[44]

An areawide waste treatment management system must have adequate authority to carry out the plan. This includes the types of authority detailed in Chapter III.

The 208 plan must recommended institutional arrangements for implementation of the plan. This must include arrangements for continuing planning as well as for a management system. In some cases, existing institutions may be utilized. But, new arrangements may be needed to "relate existing governments of various types and powers to the areawide management agency or agencies."[45]

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[44]U.S. Environmental Protection Agency, Draft Guidelines, p. 8-1.

[45]Ibid.

Institutional Analysis

Ongoing 208 studies are analyzing existing and potential institutional arrangements for meeting the requirements of the Act.

Table 15 summarizes an analysis of possible institutional arrangements in Virginia. This study, done by the Fifth Planning District Commission (Roanoke), does not address the same specific points as the Knox County, Tennessee, study. The alternatives considered also differ. The alternative which appears to be best from a standpoint of available authority is the "mixed alternative" approach. The accuracy of this assessment depends upon the actual mix of institutions included in such an arrangement. But, it is the only possible regional or areawide approach that could serve each river basin, and also could impose land-use controls. Of the other possible institutional arrangements identified for Roanoke, only Service Districts also have this authority to regulate land-use. However, Service Districts do not have areawide jurisdiction on par with Multi-Jurisdictional Service Contracts, Sanitation Districts, or Water and Sewer Authorities. A Sanitary District, unlike the other alternatives, is not capable of serving the entire region.

Table 16 and Table 17 both summarize authorities of possible institutional arrangements for sewerage services in North Carolina. The first of the two tables is concerned

TABLE 15

INSTITUTIONAL ARRANGEMENTS FOR PROVIDING SEWERAGE SERVICES IN VIRGINIA

Features	Institutional Arrangements					
	Sanitary Districts	Service Districts	Water and Sewer Authorities	Sanitation Districts	Multi-Jurisdictional Service Contracts	Mixed Alternative
1. Legal Capability to serve:						
a. Region	-	+	+	+	+	+
b. Each river basin	-	-	-	+	+	+
c. Multiple service areas	-	-	+	+	+	+
2. Legal Authority to:						
a. Construct treatment works	+	+(1)	+	+	+	+(2)
b. Operate and maintain treatment works	+	+(1)	+	+	+	+(2)
c. Construct collection systems	+	+(1)	+	+	+	+(2)
d. Operate and maintain collection systems	+	+(1)	+	+	+	+(2)

TABLE 15 (continued)

Legend: + indicates institution has the specified authority.
- indicates institution does not have the specified authority.
(1) These features can exist if enumerated in the approved plan to create the service district, and in the charter for the service district.
(2) This authority carries through the existence of one or more authorities, districts, or multi-jurisdictional contracts.

Source: 208 Areawide Wastewater Management Plan. Draft. Water Quality Management Alternatives, Sections II and III (Roanoke, Virginia: Fifth Planning District Commission and Moore, Gardner & Associates, Inc., November 19, 1974), Appendix 5, pp. 1-15.

TABLE 16

INSTITUTIONAL ARRANGEMENTS FOR PROVIDING SEWERAGE SERVICES IN NORTH CAROLINA

Feature	Institutional Arrangements						
	City or County	Interlocal Contract	Joint Management Agency	County Service District	Sanitary Distict	Water and Sewer Authority	Metropolitan Sewerage District
1. General Corporate Powers	+	+(1)	+(2)	-	+(3)	+	+
2. Own, Extent and Operate Sewerage Systems	+	+	+(2)	+(4)	+	+	+
3. Acquire Sewerage Systems	+	+	+(2)	+(4)	+	+	+
4. Construct Sewerage Systems	+	+	+	+(4)	+	+	+
5. Power of Condemnation	+	+(5)	-	+(4)	+	+(6)	+
6. Regulate Land Subdivision	+	+(5)	-	+(4)	-	-	-
7. Zoning Powers	+	+(5)	-	+(4)	(7)	-	-
8. General Policy Powers	+	+(5)	-	+(4)	-	-	-
9. Provide other Public Services	+	+(5)	+(8)	+(5)	+	-	-

TABLE 16 (continued)

Legend:
(1) Units must hold legal title to real property individually or as tenants in common.
(2) However, the Joint Management Agency may not hold legal title to real property.
(3) However, many powers are subject to approval by Commission for Health Services (CHS).
(4) The county may perform these functions, but the County Service District has no separate authority.
(5) The local governments involved have this power individually.
(6) Procedure is same as used by cities and towns except that Environmental Management Commission approval is necessary if water or land with water rights is acquired.
(7) Only if Sanitary District is contiguous to one town and within three miles of two other towns.
(8) Depending on terms of agreement.

Source: 208 Inventory of Existing Resources (Research Triangle Park, N.C.: Triangle J Council of Governments, March 8, 1976).

TABLE 17

INSTITUTIONAL ARRANGEMENTS FOR CONTROLLING NONPOINT SOURCE WATER POLLUTION IN NORTH CAROLINA

Feature	Institutional Arrangements						
	City or County	Interlocal Contract	Joint Management Agency	County Service District	Sanitary District	Water and Sewer Authority	Metropolitan Sewerage District
Land-Use Planning	+	+	+	-	(1)	-	-
Floodway Regulation	+	-(2)	-(2)	-	-	-	-
Open Space Acquisition	+	-	-	-	-	-	-
Economic Development	+	+	+	-	-	-	-
Building Code Regulation	+(3)	-(2)	-(2)	-	-	-	-
Septic Tank Regulation	+(3)	-(2)	-(2)	-	(4)	-	-
Require E.I.S.	+	-(2)	-(2)	-	-	-	-
Solid Waste Management	+	+	+	+	+	-	-
Recreation Services	+	+	+	+	+	-	-
Soil and Water Conservation	(5)	(5)	+	-	-	-	-
Sedimentation Control	+	-(2)	-(2)	-	-	-	-
Beach Erosion Control	+	-(2)	-(2)	+	-	-	-
Regulate Mining Practices	+(3)	-(2)	-(2)	-	-	-	-
Regulate Forestry Practices	+(3)	-(2)	-(2)	-	-	-	-

TABLE 17 (continued)

Feature	Institutional Arrangements						
	City or County	Interlocal Contract	Joint Management Agency	County Service District	Sanitary District	Water and Sewer Authority	Metropolitan Sewerage District
Oil Pollution Control	+(3)	-(2)	-(2)	-	-	-	-
Pesticides Regulation	+(3)	-(2)	-(2)	-	-	-	-
Air Pollution Control	+(3)	-(2)	-(2)	-	-	-	-
Streets	(6)	+	+	-	-	-	-
Stormwater Facilities	+	+	+	-	-	-	-

Legend: (1) Limited.
(2) While regulations may not be adopted under an interlocal contract or through a joint management agency, regulations adopted by cities and counties and the related programs in these areas may be administered through interlocal contracts or a joint management agency.
(3) State activity in these areas is primary. It appears, however, that cities and counties may adopt regulations not inconsistent with state requirements under their general police powers (and under G.S. 169A-185 in the case of cities).
(4) Uncertain.
(5) Counties only

Source: 208 Inventory of Existing Resources (Research Triangle Park, N.C.: Triangle J Council of Governments).

with various general features. The second focuses upon authority for specific land-use controls that could be utilized to control nonpoint sources.

The first of these tables indicates that city or county government or Interlocal Contracts may be the best means of providing the wide range of necessary authority for an effective areawide waste treatment management agency. A County Service District also has potential, but does not have the general powers of the other arrangements, and would depend upon county government for regulatory control over land-use development. The Sanitary District would also depend upon local government for land-use controls. The Joint Management Agency, Water and Sewer Authority, Metropolitan Water District, and Metropolitan Sewerage District concepts all lack land-use control authority. However, they each have capability to manage facilities.

Table 17 deals specifically with the nonpoint source control authority of the possible water and sewerage institutions in North Carolina. None of the possible arrangements have authority for all of the features. City government has authority for all of the controls excepting Soil and Water Conservation—which is strictly a county function. County government has authority for all controls except street cleaning, which is a city function. Other arrangements have authority for seven or fewer of the twenty controls listed. After the local governments, only the Interlocal Contract

and the Joint Management Agency concepts have any real measure of nonpoint source control. The conclusion must therefore be made that general purpose local governments will undoubtedly play an important role in any future areawide management system. Specialized agencies may also be utilized, but will be confined, for the most part, to point source controls.

V. SUMMARY OF IMPLEMENTATION TECHNIQUES

The implementation techniques discussed in this chapter can be most effective when developed in concert. This is the function of 208 areawide water quality management planning—to develop an implementable plan that is cost-effective and will allow an area to meet the 1983 goal of the Act.

The most cost-effective plan will combine the use of facilities and nonstructural controls such as land-use regulations and best management practices for agricultural, silvicultural and mining areas. Decisions regarding the use of a particular facility or control will be based upon an analysis which will identify the alternative means of meeting the required standards, and select a "package" which is both cost-effective and acceptable to the implementing jurisdictions.

The Act requires that a management system be devised that can effectively implement the plan. The Act and its

implementing regulations and guidelines require that the management system devise and utilize a charge system that will recover the costs of constructing, operating, and maintaining facilities. By charging a class of users on the basis of treatment costs associated with that class, the 208 management system will meet theories of public finance and economics.

This chapter has summarized implementation techniques. The following chapter is a general summary of the entire study.

CHAPTER V

SUMMARY AND CONCLUSIONS

Areawide water quality management planning ("208") is the key component of a complex and far-reaching national program for controlling and eventually eliminating all sources of water pollution in the United States. More than any previous program, it is designed to develop a pollution control system as an integral part of overall regional planning and development. More than any previous program, it is designed to be a continuing process. It has the potential to be particularly important because of its mandate for implementation by local agencies in order for them to continue to be eligible for Federal grants for wastewater treatment facilities.

Areawide water quality management planning has been identified by many as a method of advancing national land-use planning without passage of a national land-use bill. There is some justification for this due to 208 requirements for land-use forecasting, development of a 20-year plan, emphasis on nonstructural controls, and coordinative measures. At the same time, there appears to be a great deal of flexibility being allowed in program development at the regional level.

The concept of not only cleaning up polluted water, but developing a program to prevent pollution in the future, is

of revolutionary importance. Tied to the requirements or implementation and continued planning, it indicates a national commitment to shaping society so that future development, and future use of land, is done in a manner that is environmentally sound. If this commitment is adhered to, the program will have serious social and economic ramifications, as well as environmental effects. If implemented in a consistent manner on a national basis, 208 and its companion provisions of the FWPCAA will impact the way industrial plant location decisions are made—by causing industries to internalize the cost of pollution abatement.

I. SUMMARY OF METHOD AND SCOPE OF 208 PLANNING

As a key program for implementing the Federal Water Pollution Control Act Amendments of 1972, 208 planning has a broad scope and purpose. Meeting the 1983 goal for fishable and swimmable waters and the 1985 goal of "zero discharge" requires imaginative and far-reaching planning.

The 208 planning process, as it is now developing, is a function of "designated" areawide planning agencies and state water quality planning agencies. The function of designated agencies is to develop 208 plans for their designated areas. The functions of the state agencies are to develop 208 plans for the nondesignated areas of the states and to coordinate all 208 planning, statewide.

The plans for the 208 areas are developed by areawide planning agencies. The agencies usually employ technical staff, including a project director and supporting staff, and technical consultants. They are also usually aided in the planning process by a state agency which performs coordinative and leadership functions and may also provide specific services. Base level services to be supplied by a state agency usually include certification of laboratories and lab techniques and selection of models.

The scope of 208 planning involves developing a technical plan in accordance with the provisions of PL 92-500 and appropriate EPA regulations and guidelines, and development of a management plan in accordance with provisions of the same Act, regulations and guidelines. Moreover, the plan must be implementable. The implemented plan will take the 208 planning process beyond the scope of most previous planning programs, since it will effect the operating systems for wastewater treatment and the agencies that manage land-use controls, building permits and other regulations. Unlike any previous planning, 208 planning envisions planning and plan implementation for the entire geographical area of the United States.

Areawide 208 planning is initially a two-year process, with provisions for continuous plan updating and refinement. Problems that cannot be addressed and solved within the initial two years are to be dealt with in future years—until

all problems are resolved. The continuing process is to guarantee the ultimate continued state of high-quality waters wherever attainable.

The process emphasizes nonstructural remedies, and cost-effective solutions. It encourages novel and revolutionary solutions. It requires public participation and local government performance.

The process is complex and must involve many agencies, in addition to local governments, to achieve any modicum of success. Related governments and implementing agencies are to participate in the process through policy and technical advisory committees. The general public within the planning area is to be brought into participation through citizen advisory committees, public information programs, public workshops, meetings and hearings.

The plan is to consider not only sewage treatment, and runoff from urban and rural areas, but also disposal of residual wastes and protection of groundwater.

Municipal waste treatment facilities plans, funded by Section 201 of the Act, become an integral part of the 208 plan. The 208 areawide agency is involved in delineating planning areas for future facility planning, and reviewing completed 201 plans.

The 303(e) State Basin Plans provide water quality information to be used in 208 planning. The final 208 plan becomes part of the revised 303(e) plan. And, annual

revisions of the 208 plan must be certified as in compliance with the revised state plan. Section 402 NPDES permits provide a regulatory tool for implementing the statewide plan, including approved areawide provisions.

Because it is a complex program, 208 water quality management planning draws upon many other programs for input data, technical assistance, and implementation of planning provisions. Among these are water resource monitoring programs of states and such agencies as TVA; Corps of Engineers Urban Studies Programs; solid waste and air quality planning; transportation and land-use planning; EPA technical assistance programs; flood plain management; community development, and USDA programs which provide loans and grants for resource conservation and technical assistance in implementing land management practices on agricultural land.

The planning process involves utilizing existing data, and analyzing it to identify current and anticipated problems. Identification of problems utilizes public input and evaluation. Priorities are established for the initial two-year period. A Plan-of-Study is then developed to address the priorities which are of most immediate concern.

The planning process involves both technical planning to achieve desired water quality results and management planning to ensure efficient implementation of technical plans.

The planning process itself is a complex extension of evolving procedures for plan development. It links together

progressive theory from technical fields such as environmental engineering, modeling, remote sensing, wastewater treatment, and residual waste management with those of fields such as environmental planning, public administration, economics, and public finance.

Development of the plan and its continual updating require public input. The citizen involvement process is dynamic and active, rather than passive. It involves interaction with citizen groups, not just public information and public relations.

II. SUMMARY OF IMPLEMENTATION TECHNIQUES

Effective control of water pollution requires development of a carefully considered program for controlling water pollution problems and a management system for implementing the controls.

Implementation techniques include provision of treatment facilities, sludge disposal, and nonpoint source controls. The level of sophistication required of the treatment facilities will depend upon the waste source generation within a given area and instream conditions and capabilities for natural assimilation of wastes.

Since there is a national goal for elimination of all pollutants by 1985, policy planning and land-use management are essential. The types of regulations and best management practices that will be required will vary from one area to

another. But the ultimate objective must be the same—eventual elimination of all discharges and return to natural conditions.

Techniques that 208 planners now believe will be most acceptable and most productive are those that can deal directly with pollution problems without involving controls beyond those which directly contribute to pollution abatement. Planners who responded to questionnaires indicated that specific control measures such as construction permits, development permits, grading regulations, hillside regulations, and land conservation policies would be more beneficial than more general controls such as zoning.

Institutional arrangements and attendant fiscal and financial controls have potential for alleviating pollution problems. By developing equitable user-charge systems, including industrial cost-recovery, implementing management systems can cause polluters to pay for pollution, thus putting emphasis on pollution abatement at its generating source rather than necessitating more sophisticated municipal treatment plants for removing complex pollutants. This will lead to more emphasis on industrial process changes and recycling of industrial byproducts. If user charge systems vary greatly from area to area, redistribution of industry may result. However, effective enforcement at the national level can result in eventual realization of true economies in distribution of population and production.

III. ANTICIPATED IMPACTS ON COMPREHENSIVE PLANNING

The 208 process could have profound effects upon comprehensive planning at the areawide and local levels. Positive effects will include new technical skills learned by planners involved in the process, and greater familiarity of the planners with other Federal and state programs which have an impact on land-use and pollution control. The program should result in closer working relationships between areawide and local planners.

However, the 208 process could be a threat to comprehensive planning. The 208 program considers land-use planning and control as one of its tools for achieving higher quality water. This is necessary. But, to do so at the expense of comprehensive planning would be a mistake.

A comparison could be made to highway planning. Highway planning today looks at how land-use affects highways. But, is this what's important to society? Or, is it more important what effects highway planning has on land-use and other aspects of society?

Where should the emphasis be placed by the water quality management planning process? Should land-use controls be adopted strictly for the purpose of achieving higher quality water? If this is done, will it result in detrimental effects on energy conservation, air pollution control, and the extension of other public services?

Planners, including 208 planners, are likely to agree that all other aspects should be considered. The 208 process has a mechanism for evaluating such concerns—the assessment of environmental, economic and social impacts of plan alternatives.

Environmental impact analysis, whether for highway planning or water quality planning, is a step in the right direction. However, analysis of impacts is not the same as comprehensive planning. The impetus of the plan is still toward a narrow goal such as better highways or higher quality stream water. Most of the data collected, time spent in analyzing data and generating plan alternatives, are directed toward achieving a goal which relates to water quality. A smaller amount of time, money, and effort, are spent collecting and analyzing information related to the multitude of possible impacts. As a result, 208 planning, like highway planning, affects areawide planning in a particular way. It emphasizes one goal more than others.

Highway planning and construction has had serious impacts upon cities and regions. It has divided neighborhoods, influenced land values and changes in land-uses, and affected the locations of community facilities and utilities. Comprehensive planning at the city and regional scales has often had to respond to changes brought about by highways, rather than being able to consider highways within the

comprehensive planning framework. The same thing could occur with areawide water quality management planning.

Will the 208 program advance the cause of comprehensive planning? Or, will it have mostly negative affects on city and regional land-use planning programs? It's likely affect is to overemphasize water quality compared to other areawide considerations. If new land-use controls are enacted as a result of 208 planning, they will emphasize controls that can directly alleviate water pollution problems. Such controls may not always be consistent with other planning objectives.

Despite the emphasis of 208 planning on nonpoint source controls, it is also concerned with point source controls. For the most part, plans for such facilities are being developed by the 201 municipal wastewater facilities planning program. The 201 plans, in turn, are incorporated into the 208 plans. Since 201 facilities planning and construction involves tens of billions of dollars, compared to approximately 1 percent of that amount for areawide planning, EPA has put greater emphasis on getting new facilities built than on determing effective alternatives to facilities construction. EPA officials involved in the 201 program emphasize its importance in creating new construction jobs. Such emphasis does not promote finding the most cost-effective solutions to water pollution problems. Moreover, EPA bureaucrats who deal with facilities grants ignore the

mandate for areawide planning. In fact, there appears to be an almost total lack of coordination within the EPA bureaucracy among the various programs established by the Act—201, 208, 303(e), 402, and so forth. The effect upon areawide planning is that it is being dominated by a construction program, and not by areawide water quality management planning, much less by comprehensive planning.

EPA apparently expects 208 agencies to coordinate the various programs established by the Act, even though EPA itself does not appear to be even attempting to do so. Furthermore, EPA seems to assume that land-use and environmental objectives can be made consistent by local units of government and their regional councils. The 208 program calls for 208 agencies to coordinate numerous other programs in addition to those established by the Act. However, many of these programs are Federal programs that are not effectively coordinated at the national level. How can 208 agencies coordinate programs of other agencies which deal with agriculture, the use of fertilizers and pesticides, reforestation and the use of forest products, and many other concerns, unless there is coordination at the national level? It is questionable that they can.

Though EPA has agreements with other agencies, such as the Department of Agriculture and HUD, these agreements are basically of a procedural nature. They don't say anything about important issues such as what kind of growth policies

represent the national policy for agricultural land, water resource development, energy, and other concerns. As a result, 208 agencies may find local representatives of FmHA, SCS and other agencies to be largely uncooperative or even antagonistic towards the objectives of an areawide 208 program. Without coordinated policy-making at the national level, 208 agencies may find it difficult to achieve coordination and comprehensiveness at the areawide level.

The 208 program, however, can have some positive effects on areawide comprehensive planning. First, it is oriented toward plan implementation. Without implementation, planning is an exercise in futility. Second, it involves development of a detailed five-year capital improvements budget. This could provide important information concerning the ability of local governments to finance wastewater improvements. Third, the 208 plan is management-oriented. It involves recommendations for changes in management relationships. This could have significant effects that could spill over into other areas besides water quality management planning.

IV. ANTICIPATED IMPACTS ON LOCAL GOVERNMENTS AND AREAWIDE AGENCIES

Changes in institutional arrangements resulting from implementation of an effective management system will have important consequences at the local level. Local governments

will often have new relationships with implementing agencies. Requirements for equitable financing and areawide considerations will be increasingly important as a result of provisions of the Act. This will tend to cause greater use of modern theories of public finance and management, environmental planning, and use of utility extension policies.

The areawide water quality management planning process will have definite impacts on areawide planning agencies. Many agencies have already begun to feel these impacts. The size of agency staffs and levels and types of expertise have often been affected by involvement in the program. Accounting and procurement systems of areawide agencies have often been changed to meet requirements of the Act or EPA regulations and guidelines. Program requirements for interagency cooperation and public participation have often resulted in new or greatly modified ways of plan development. This may change other programs within the same agencies.

V. ANTICIPATED RELATIONSHIPS BETWEEN PLANNING AGENCY AND MANAGEMENT SYSTEM

Will planning and management agencies be the same? It would be reasonable to assume that they generally will not be the same. However, this will vary among planning areas. And, the most favorable arrangement will depend upon various circumstances.

First, the 208 agencies which develop the initial two-year plan are usually Regional Councils or Development Districts. Generally, these types of agencies do not have authority to implement programs. Without such authority, they can't manage treatment systems. However, they have been chosen as planning agencies for developing the initial plans. And, they are likely to be the continuing planning agency in many cases, since they are existing areawide planning agencies which engage in comprehensive regional planning.

Second, in many cases it is assumed that the management system will be made up of plural management agencies. In such cases, the planning agency could be synonymous with one of the management agencies, perhaps a coordinative agency.

Third, there are both advantages and disadvantages to having one agency which is both the management agency and the planning agency. Whether or not it is advantageous depends upon the relationship between the planning and management functions. If the management system provides financial support for the planning program, it may be able to exercise some influence over the planning function. If the two functions are performed by the same agency, the relationship between planning and management would depend greatly upon the relative importance of the two functions within the agency. A technical management agency which includes continuous planning as a subordinant function may

tend to develop plans which provide justification for the desires of managing officials. Conversely, if planning and management are both performed by what is predominantly a planning agency, planning would presumably be more innovative.

The effectiveness of 208 plans may depend largely upon the state agency which reviews and certifies the plans. If this agency is supportive of areawide planning efforts, it can ensure that the continuing planning process be innovative and effective in order for the management system to continue to be eligible for state and Federal grants. EPA can contribute to the effectiveness of the process by demanding implementation if Federal funds are to be continued.

Successful 208 plans are likely to depend upon the authorities of local governments. This is true because of the requirement to provide a local share for financing utilities and because of the delegation of police power to local governments in most states.

If water quality management plans are to be implemented on an areawide basis by one agency, there will be a need for changes in the powers accorded to areawide agencies. Regional governments, with the same powers as local governments for enacting land-use controls and financing improvements, could implement water quality plans on an areawide basis. General-purpose regional government is probably not feasible, but special-purpose agencies are more likely. Control by local

governments would be necessary to ensure coordination with other local programs.

VI. ANTICIPATED IMPACT OF 208 ON SELECTED IMPLEMENTATION TECHNIQUES

The 208 process will have some impacts on implementation techniques. The actual impacts that occur will depend upon the success of the program. These efforts may not be immediate, since many refinements to 208 plans will be made during the continuing planning process.

One possible effect of 208 could be to require implementation techniques to be tied more to specific effects of land uses on the environment. Quantification of such effects could require monitoring of streams, determination of runoff coefficients, and so forth, to identify the most effective control measures.

Second, more emphasis may be placed in other programs on selecting implementation techniques which are more specific in their effects on particular problems which they address, and more concern for implementability.

Third, selection of implementing agencies may be done with appreciation of the areawide context, rather than on a piecemeal basis with a haphazard collection of controls selected over a period of time by various agencies.

Fourth, it is possible that, in the future, controls that were not selected as part of a "scientific" planning

process may be questioned. Also, citizens might demand that existing controls be re-justified, based on scientific, rational, cost-benefit analysis.

Finally, but most importantly, the method of selecting implementation techniques may be changed. As the result of experiences with the 208 process, the public may come to expect to be involved from the beginning of the development of a plan. Citizen input into developing a plan-of-study and alternative plans may become a standard planning procedure.

Will a greater degree of citizen involvement lead to anarchy and inaction? Or, will it assist leaders in making decisions that are based upon social and economic factors as well as engineering considerations? Favorable answers to these questions will require responsible input from interest groups and private citizens, and discerning use of the input by planners and public officials.

The ultimate success of 208 and other planning and implementation programs will depend upon the support of public officials and the citizens who elect them.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE ON 208 PLANNING SENT TO SELECTED
208 PLANNING AGENCIES

The following questionnaire was sent to eight selected 208 areawide planning agencies. The responses received are summarized. The following code is used to identify the responding agencies:

C—Chattanooga Area Regional Council of Governments

F—Fifth Planning District Commission (Roanoke)

H—Hampton Roads Water Quality Agency

K—Knoxville-Knox County Metropolitan Planning Commission

M—Mississippi-Arkansas-Tennessee COG/Memphis Delta Development District

N—Mid-Cumberland Council-of-Governments/Development District (Nashville)

R—Richmond Regional Planning Consortium

T—Triangle J Council of Governments (Research Triangle Park, North Carolina).

It should be noted that not all respondents answered all questions.

A QUESTIONNAIRE ON 208 PLANNING TO BE USED FOR A THESIS
FOR A MASTER OF SCIENCE IN PLANNING DEGREE AT THE
UNIVERSITY OF TENNESSEE SCHOOL
OF PLANNING

(BY ROBERT A. PURCELL)

Information Provided By:

208 Planner's Name_____

Position or Title_____

Agency_____

City_____

State_____ Zip_____

We have attempted to ask questions in this questionnaire that can be answered simply and quickly. However, in some cases if you want to answer in more detail, please do so. In addition, we would appreciate receiving any reports, memos, ordinances, etc. that relate to any of the questions or that describe your planning efforts in general, particularly those related to land-use and environmental planning.

Please return this questionnaire to:

ROBERT A. PURCELL
RT. 4, BOX 105 K
BLUFF CITY, TN 37618

A stamped, self-addressed envelope is enclosed.

If you have any questions, please call me at (615) 538-6979.

A. GENERAL INFORMATION

To help analyze the responses from the questionnaire sample, we would like just a few items of general information about your agency (not just the 208 section).

1. Number of Planners (persons in professional level positions with planning degrees or experience). C-8 H-3 K-10 M-7 N-7 R-1 T-6

2. Number of personnel with degrees in environmental fields.
   ____Environmental Science/Engineering. C-1 E-1 M-2 N-1 T-2
   ____Architecture/Urban Design. F-3 N-4
   ____Environmental Planning. H-2 K-1
   ____Ecology/Natural Sciences. K-2 T-2
   ____Landscape Architecture. K-1
   ____Environmental Health. N-1
   ____Others (specify). H-1 (Economics) N-1 (Transportation)
   R-1 (Economics/Regional Planning

3. Please try to classify your "agency type" by checking the appropriate characterization.
   ____Local City Agency (1 single municipality).
   ____Local County Agency (1 single county jurisdiction).
   ____Metropolitan Agency (jurisdiction of principal city, regardless of size, plus one or more cities or counties). K
   ____Regional Agency (multi-county jurisdiction. C, F, M, N, T
   ____Other (please specify). H-single purpose multi-regional agency
   R-multi-jurisdictional 208 agency

B. GENERAL ORIENTATION TO ENVIRONMENTAL PLANNING IN YOUR AGENCY

4. Which one of the following phrases best expresses your agency's view of environmental planning?
   ____Provision of anti-pollution systems and controls. H
   ____Design urban environments for human use. C, T
   ____Integrating man-made and natural systems. K, M, N, R
   ____Protecting natural eco-systems.

5. From your agency's point of view, how important are environmental problems at your agency's jurisdiction?
   Present:
   ____our most critical problem. H
   ____critical, but not most important. N
   ____important, but not critical. C, F, K, M, T
   ____relatively unimportant. R-impossible to categorize
   environmental vs. other issues

6. Please specify the more critical urban problems at present:
   C-Health Care, unemployment, Housing
   K-Sewer extension, transportation, center city
   T-Water quality, sewer services, water supply (long-range)
   F-Drug Abuse, Criminal Justice, Transportation

C. QUESTIONS CONCERNING YOUR VIEWS OF THE 208 PLANNING PROCESS AND ITS RELATIONSHIP TO OTHER PROGRAMS.
Questions may have more than one answer.

7. (a) None
   (b) A member of the 201 Technical staff will be on our Technical Committee. H, K, M, N, R
   (c) Cities which have 201 plans ongoing will have representation on Policy Committee as with other cities & counties. C, M, N, R
   (d) We are a 201 planning agency.
   (e) The 201 plan will be finished before 208 and will be used as a basic document or source for 208 planning. C, H, K, R, T
   (f) Other (specify) F, H, M, R, T

8. What mechanisms do you have for involving local governments:
   (a) Membership on the Policy Committee (Chief Elected Official). C, F, H, M, N, R, T
   (b) Membership of Technical Advisory Committee (Engineer or City Manager). C, F, H, K, M, R, T
   (c) Membership on a Citizens Advisory Committee (Council Members, etc.).
   (d) Hearings will be held in each of cities involved. C, F, K, T
   (e) Other. H, K, M, R, T

9. What mechanisms have you established for coordination with 303(e) basin plans?
   (a) A representative of the state agency that was responsible for the basin plan will be on our Technical Advisory Committee. C, H, K, M, N, R, T
   (b) The 208 plan will serve as a technical refinement to the appropriate 303 e basic plan. C, F, H, K, N, N, R
   (c) The state agency that was responsible for 303(e) basin plan has assigned someone from its staff to work with the 208 staff from time to time to ensure coordination of efforts. F, H, K, R, T
   (d) The state agency that was responsible for 303(e) basin plan will have the responsibility of reviewing the completed 208 plan. C, F, H, K, M, N
   (e) Other. M

10. What mechanisms have you established for coordination with the 402 Permit Program?
    (a) None
    (b) We are a depository of 402 permit information. C-we will be
    (c) We have information concerning the permits. C, F, H, M, N, R, T
    (d) We have information concerning the permits from 201 plans. K, M, T
    (e) Other. K-we are at present initiating a study and analysis of both the 402 permit system and the Tennessee State permit program with the intent of establishing a coordinative mechanism between EPA, State and 208.
    R-through state agency issuing the permits.

11. What mechanisms do you have for involving related technical agencies?
    (a) Technical agencies such as EPA, Soil Conservation Service, Corps of Engineers, etc. will be represented on a Technical Advisory Committee. C, F, H, K, M, N, R, T
    (b) The Technical Advisory Committee will meet monthly. H, K, M
    (c) The Technical Advisory Committee will review the completed plan. H, K, M, N, T, F
    (d) Other (specify). F, H, K, M, R

12. Which technical agencies have been most helpful to you (or which do you expect to be most helpful to you) in the 208 planning process?
    (a) Tennessee Valley Authority (TVA). K
    (b) U.S. Soil Conservation Service. C, K, M, N, T
    (c) U.S. Dept. of the Interior. C, T
    (d) U.S. Army Corps of Engineers. F, M, N, T
    (e) Other (name) _____ _____
    _____ _____ _____

13. What mechanisms have you established for Public Participation?
    (a) A Citizens Advisory Committee. F, H, N, T
    (b) A newsletter to be mailed to interested groups and individuals. C, F, H, M, R, T
    (c) An information depository for interested citizens. F, H, K, M, N, R, T
    (d) A series of public meetings and public hearings. C, F, H, K, M, N, R, T
    (e) Other (specify). F-news articles, etc.
    H-special field exercises and public education seminars
    K-presentation to citizen groups

14. How important do you expect public interest groups (such as the Sierra Club, League of Women Voters, etc.) to be in developing the 208 plan?
    (a) Very important. H
    (b) Important. C, K, N, T

14. (continued)
(c) Unimportant. F
(d) Other (specify). R-will provide the opportunities-whether they take advantage of them will determine their importance

15. What methods do you expect to use for evaluating management alternatives?

The responses varied, but centered around cost-effectiveness evaluation, and potential for implementation. Workshops and advisory committee meetings involving city and county officials and staff were generally considered the means for making such evaluations.

16. What methods do you expect to be most useful in evaluating management alternatives? Why?

Answers varied from "Don't know" or "Too early to tell" to "Review by local officials and General Assembly representatives" to "Testing the quality of the water." The last response reflects the ultimate test for effectiveness, while the others answer to how the immediate policy decisions will be made.

17. What do you see as the State Role in developing your 208 plan?
(scope) (a) Limited in scope. C, N, T
(b) Extensive. F, K, M
(type) (c) Coordinative. C, F, K, M, N, T
(d) Strictly a review process when the plan is completed.
(e) Other (specify). R

18. What do you see as EPA's role in the planning process? (Two or three answers may be appropriate.)
(scope) (a) Limited. C, F, N, T
(b) Extensive. K, M
(type) (c) Coordinative. K, M, N
(d) Strictly a review process when the plan is completed. C, F, T
(e) Other (specify). N-technical assistance
R-trying to apply the general requirements of PL 92-500 to specific area but be consistent

19. What degree of coordination do you expect to have with Air Quality Programs:
(a) We will have an Air Quality representative on our Technical Committee. C, F, H, N, T
(b) Other (specify). K, R
(c) We have no air quality problems in 208 area. C, F, K, M, N
WHY? (d) We have only limited air quality problems in the 208 area.
(e) We have extensive air quality problems in the 208 area. R-we want to determine the air quality trade-offs of options we develop.

20. What degree of coordination do you expect to have with solid waste programs?
    (a) We do solid waste planning within our agency. C, M, T
    (b) Other (specify) F, H, K, N, R

21. How important will coordination with U.S. Army Corps of Engineers Urban Studies be to your 208 Study?
    (a) Very important, as we have an Army Corps of Engineers Urban Study within our 208 area. M, N
    (b) We have no Army Corps of Engineers projects in our area at the present. C
    (c) Other (specify) H, M, R, T

22. How important do you expect land-use controls to be in implementing your 208 plan?
    (a) Unimportant.
    (b) Important. C, M
    (c) Very important. K, T
    (d) It's difficult to say, since there have been no studies showing direct relations between land-use and water pollution in our area. F, H, N
    (e) Other (specify). R

23. Please indicate how important you expect each of the following regulations, etc., might be as means of limiting nonpoint source pollution. Please use the letter code indicated.

    NOTE: neither the Richmond nor the Nashville agencies responded to this question.

    (a) Very beneficial in controlling sources of pollution.
    (b) Somewhat beneficial.
    (c) Little or no effect.
    (d) Somewhat detrimental.
    (e) Very detrimental.

    Zoning. C-b F-b H-b K-b M-b T-a

    Flood plain zoning and regulation. C-c F-b H-b K-b M-b T-a

    Environmental performance zoning. C-b F-c K-c M-b T-b

    Subdivision regulations. C-c F-b K-b M-a T-a

    Buffer zones. C-b F-a H-b K-c M-c T-b

    Conservation and scenic easements. C-b F-b H-b K-c M-b T-b

    Density bonuses. C-c F-c H-b K-b M-c T-b

    Housing codes. C-c F-c H-b K-c M-c T-c

    Building codes. C-c F-b H-b K-b M-a T-c

    Construction permits. C-a F-b H-b K-a M-a T-a

23. (continued)

Development permits. C-a F-b H-b K-a M-a T-a

Transferable development rights. C-d F-b H-b K-b M-b T-b

Hillside development regulations. C-a F-a H-b K-b M-a T-a

Grading regulations. C-a F-a H-b K-b M-a T-a

Taxation policies. C-c F-c H-b K-c M-b to c T-b

Public works policies. COa F-c H-b K-b M-c T-a

Public investment policies. C-b F-c H-b K-b M-c T-b

Land conservation policies. C-a F-b H-b K-b M-b T-a

Discharge permits. C-c F-b H-b K-a M-c T-a

24. Please elaborate on how you feel land-use planning and the various controls listed in question #23 (or any other regulations, etc., that you may want to consider) can be used in controlling sources of water pollution.

C-Urban and rural areas with potential point/nonpoint problems should be subjected to controlled development. Those areas with present problems should be analyzed, corrective measures taken, and preventive measures adopted.

H, F-No response

K-The most effective controls will, I think, be directed at control early in a particular action—e.g., land development; to the extent that many of the controls/regulations to be recommended can be incorporated into an existing administrative structure/ operation.

M-We consider the nonpoint problem to be related directly to sediment in our area. Perhaps the changing of land-use from one type to another could be considered as having a two-fold effect or impact on water quality. First impact will be during construction. This may be the most severe. Second, the long-term impact of the changed land-use on water quality (this nonpoint pollution may very well be caused by parameters other than just sediment).

N-Too early to tell. If we had the answers to this question now we would be well along to solving our problems.

R-I would imagine that studies will show that each of the aforementioned regulations can serve as partial source controls under specific circumstances. The key question then becomes whether one can apply these controls in some manner which results in an equitable incidence of costs and benefits.

24. (continued)

T-To the extent that there is a relationship between land-use and water quality, zoning ordinances and other regulatory measures which influence spatial distribution of land-uses and the intensity of development will affect water quality.

25. How important do you expect point source controls to be in implementing your 208 plan?
(a) Unimportant.
(b) Somewhat important.
(c) Important. N
(d) Very important. C, F, H, K, M, R, T
(e) Most important. (More important than any other method of controlling water quality.)

26. How important do you expect nonpoint source controls to be in implementing your 208 plan?
(a) Unimportant.
(b) Somewhat important. F
(c) Important. C, H, K
(d) Very important. N, R, T
(e) Most important. (More important than any other method of controlling water quality.) M

27. How important do you expect taxation policy to be in implementing your 208 plan?
(a) Unimportant. K
(b) Somewhat important. F, T
(c) Important. H, M, N
(d) Very important. C
(e) Most important

28. Do you expect to need new state enabling legislation in order to implement an effective 208 plan?
(a) Yes. C, K, R
(b) No. F, H, M, T N-too early to tell

29. If the answer to #27 is Yes, what authority do you expect to need?
C-interlocal agreements in bi-state area
K-restructuring of Utility Districts

30. What is your analysis of 208 planning as an effective tool for water quality management? Why? F-no opinion
(a) Not very effective.
(b) Somewhat effective. T WHY?_____
(c) Effective. C, H, K, M _____
(d) Very effective. R _____
(e) It should solve most problems.

31. What is your opinion of 208 planning's expected impact on areawide Land Use Planning? Why?
    (a) Very little or no beneficial effect. F
    (b) It will have a moderate beneficial effect. C
    (c) It will have an important effect on land use planning. C, H, K, M, N, R*, T
    (d) It will have a detrimental effect on land use planning.
    (e) Other (specify).

(R*-it could)

32. What relationships do you expect with HUD 701 planning?
    (a) There will be a very limited relationship between the two programs. F
    (b) 208 planning will cause problems with 701 planning.
    (c) 208 planning will present an opportunity for a more detailed analysis of land use planning in a specific area. C, H, K, M, N, T
    (d) 208 planning will provide funds and technical tools for detailed land use planning. K
    (e) Other (specify). R

33. What relationships do you expect with the HUD flood insurance program? M-no response
    (a) Very limited. T, R
    (b) An essential relationship. The 208 plan must comply with provisions of the flood insurance program. C, N
    (c) Other (specify). H, K, F

34. What relationships do you expect with transportation planning under DOT and State programs?
    (a) Very limited or none. F, T
    (b) 208 will identify areas with fragile environmental systems where roads should not be permitted. C, M
    (c) 208 planning will affect future locations of industries, commercial business and subdivisions, thus affecting locations of roads. C, H, N
    (d) Location of roads will affect locations of industries, commercial business and subdivisions thus affecting location of point and nonpoint pollution. H
    (e) Other (specify). K, K, R

35. What relationships do you expect between 208 planning and U.S. Soil Conservation Service programs?
    (a) Very limited.
    (b) Soil Conservation Service to be on Technical Advisory Committee. ALL
    (c) Soil Conservation Service to be important source of information concerning agricultural nonpoint sources of pollution. C, F, H, K, M, N, T

35. (continued)

(d) Soil Conservation Service to be important in identifying solutions to nonpoint source problems. C, H, K, M, T
(e) Other (specify).

36. What relationships do you expect between 208 planning and programs of the Tennessee Valley Authority?
(a) Very limited. M, N
(b) TVA to be represented on Technical Advisory Committee. C, K
(c) TVA to be an important source of information concerning water quality. C, K
(d) May be able to use TVA water quality and land use models. C
(e) Other (specify). F, H, R, T—not in the TVA area

37. What relationships do you expect between your 208 planning (agency or department, etc.) and The State Agency(s)?
(a) Very limited.
(b) They will be member of Technical Advisory Committee. C, F, H, K, M, N, R, T
(c) They will meet regularly with us to coordinate our activities. H, K, M, N, R, T
(d) They will be on the Governor's review committee which will review our completed plan. H, K, M, N, T
(e) Other (specify). K-except for Division of Water Quality, State agencies are unable to participate due to insufficient resources.

38. What relationships do you expect between your 208 planning and the National Oceanic and Atmospheric Administration (NOAA)?
(a) None. We have no coastal or estuarine areas within our 208 study boundary. C, F, K, M, N
(b) Very limited. R
(c) They will be a member of our Technical Advisory Committee.
(d) They will provide us with technical data. T
(e) Other (specify). H-State Planning Department is CZM agency, and sits on our Regional Advisory Committee

39. What relationships do you expect between 208 planning and other* Environmental Planning?
(a) Very limited.
(b) Limited.
(c) Moderately important.
(d) Important. C, H, K, F, N
(e) Very important.

*Please identify "other" Environmental Planning Programs.
Air quality, solid waste, National forest.

40-44. What relationships do you anticipate between 208 planning and other programs, such as
New Towns
Local and Regional Land Use Planning
State Land Use Planning
National Land Use Planning

40. New Towns
(a) Very limited. F, T
(b) Limited. K, M
(c) Moderately important. N, C
(d) Important.
(e) Very important.

41. Local Land Use Planning
(a) Very limited.
(b) Limited.
(c) Moderately important.
(d) Important. C, H, M
(e) Very important. F, K, N, T

42. Regional Land Use Planning
(a) Very limited.
(b) Limited.
(c) Moderately important. F
(d) Important. C, H, K, M
(e) Very important. N, T

43. State Land Use Planning
(a) Very limited.
(b) Limited.
(c) Moderately important. C, F, M, N
(d) Important. H, K
(e) Very important. T

44. National Land Use Planning
(a) Very limited. F
(b) Limited. C, M
(c) Moderately important. K, N, T
(d) Important.
(e) Very important.

45. Is your agency (other than your 208 section) involved in computerized land use modeling?
(a) Yes. H-member agencies are
(b) No. C, F, K, M, N, T
R-N/A

46. If the answer to #44 is "No" do you expect the 208 planning program to provide an opportunity to develop a computerized land use model that can be used in other planning programs of your agency?
(a) Yes. C, K, M, N, R, T
(b) No. F

47. What relationship do you expect between the research performed by the 208 planning section and the other data gathering of your agency?
(a) No relationship. WHY NOT?_____
(b) 208 planning will use our basic research facilities.
(c) 208 planning will result in a great increase in our research work. F, N

47. (continued)

(d) 208 planning will provide us with a greatly increased data base for other types of planning. H, K, M, N, C, R, T
(e) Other (specify).

48. Please make any general comments which you care to make concerning your 208 planning agency and its relationship to other planning and implementation programs both inside and outside your agency.

C-Should be closely coordinated with all local and regional planning programs.

H-HRWQA is a consortium: includes 10 cities, four counties—Hampton Roads Sanitation District, Peninsula Planning District Commission, Southeastern Virginia Planning District Commission.

K-Our agency is establishing working relationships with many other planning and implementation programs (many as a result of 208 efforts).

M-208 will be an asset for the area and for MATCOG/MDDD.

N-All will be coordinated and utilized in the planning process if appropriate.

T-We are making strong efforts to coordinate the land use planning element of our 208 plan with statewide planning programs. Local planning efforts will be inputs to our 208 planning and we will evaluate the water quality implications of local plans.

R-If 208 planning is not viewed as "critical-time frame physical/economic management planning" (as opposed to water quality or even environmental planning) then it will be subject to the same shortcomings as 701 and DOT-funded planning—all the key relationships, tradeoffs, and secondary impacts are considered "externalities."

F-No response.

49. How does 208 planning fit in with your own background and professional aspirations?

C-208 will be invaluable in developing skills in engineering management.

H-Wonderfully.

49. (continued)

K-The 208 program is providing me with an opportunity to work on a day-to-day basis with the most basic data resources, thereby relating the overall comprehensive community planning effort to the "gut" issues—also, the administrative experience is excellent.

M-Very timely (I hope).

N-My background is in regional planning, primarily land use. I am expecting the experience gained in the 208 program to enhance my professional future by exposing me to the various administrative tasks required by directing a major federal program.

R-It's "right there," especially in the evaluation tools and information for decision-making it can provide to local governments.

T-I brought very little knowledge of the technical aspects of water quality to this program. Although I've had some 15 years' experience in land use planning, considerations of water quality were given little emphasis. This gap in my experience is being filled by qualified water quality specialists recruited specifically for the 208 project.

F-No response.

50. Please make any constructive comments that you wish to make concerning the structure and contents of this questionnaire.

C-I am interested in obtaining a summary of your findings.

F-No response.

H-No response.

K-A relatively brief comment at the beginning which describes in some more detail your thesis problem and methodology would be helpful.

M-Did I pass? I liked your section on Nonpoint Pollution.

N-Many of the questions are concerned with subjects that are almost totally unknown at this early date. However, many "208" programs are further advanced than others and are probably necessary and valid in many cases. I would like to see the results of this effort if possible.

T-A very well designed questionnaire. We'd be interested in a compilation of the results.

APPENDIX B

INTERVIEW QUESTIONS

The following general questions were asked of the Federal, state and areawide planners and officials who were interviewed for this thesis. The interviews generally went bdyond these questions, depending upon the responses of those interviewed.

Questions for EPA Regions III and IV 208 Coordinators

1. What considerations have been given to tie 208 planning into the overall planning effort including consideration of possible national and state land-use legislation?

2. What mechanisms will be available after 208 plans are completed to update the plan? (Any federal funds?)

3. Can 208 plan up-dating be done as part of comprehensive planning program or will it require special funds because a great deal of technical work will be involved?

Questions for State Planning People

1. How do you see "208" Water Quality management planning tying in to other comprehensive planning?

2. How are state planning programs in North Carolina (Tennessee) (Virginia) going to affect 208 planning efforts?

3. How is what the 208 agencies will be doing going to affect the state planning efforts in North Carolina? (Tennessee?) (Virginia?)

Questions for Land Use Planners in "208" Designated Agencies

1. How do you see 208 planning tying in with other comprehensive planning in your agency?

2. How are the other planning programs of your agency going to affect the 208 program?

3. How is what the 208 planning staff is (will be) doing going to affect the other planning programs of your agency?

VITA

Robert A. Purcell was born in Louisville, Kentucky, in 1944. He graduated from Indiana University in 1970, with a Bachelor of Science degree in Business Economics and Public Policy, having worked in commercial banking while pursuing his degree.

In 1970 he accepted a graduate assistantship at the Graduate School of Planning, The University of Tennessee. He served as a planning intern with the Frankfort-Franklin County Planning Commission in 1971.

In November 1972, Mr. Purcell became a community planner for the Lower Savannah Regional Planning and Development Council in Aiken, South Carolina. From January 1974 to October 1975, he served successively as Regional Planner, Regional Planning Director and Acting 208 Project Director for the First Tennessee-Virginia Development District in Johnson City, Tennessee. He is currently 208 Project Director for the Land-of-Sky Regional Council, Asheville, North Carolina.