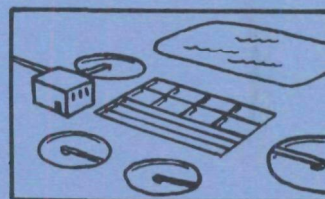
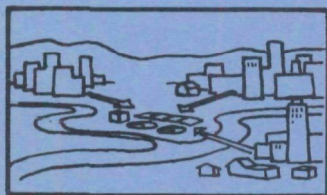
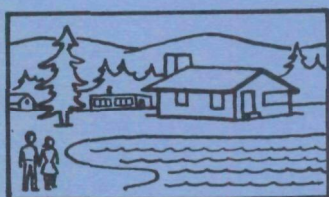


# ENVIRONMENTAL PLANNING and ASSESSMENTS FOR WATER QUALITY MANAGEMENT PLANS and PROJECTS



ENVIRONMENTAL PROTECTION AGENCY  
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GUIDES TO ENVIRONMENTAL PLANNING, ASSESSMENTS  
AND IMPACT STATEMENTS FOR WATER QUALITY MANAGEMENT PLANS  
AND MUNICIPAL WASTEWATER TREATMENT PROJECTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION I

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## ENVIRONMENTAL PLANNING, ASSESSMENTS AND IMPACT STATEMENTS

### National Requirements

The National Environmental Policy Act of 1969 (NEPA) directs any federal agency proposing an action that "significantly affects the quality of the human environment" to prepare a detailed environmental impact statement. The Act requires interdisciplinary evaluation of environmental factors and consideration of the full range of alternatives.

To comply with the Act, EPA regulations require that basin and areawide waste treatment management plans submitted by the states for EPA approval and applications for municipal wastewater treatment facility grants contain environmental assessments reflecting full consideration of environmental factors throughout the course of planning and project development.

### Environmental Assessment and Impact Statements

Figure 1 outlines the ideal sequence of basin and areawide plans and project design. Figure 2 shows the responsibilities, activities, and decisions in the accompanying environmental assessment and impact statement process.

For basin plans the State agencies or designated local or interstate agencies are required to conduct the environmental evaluations and prepare environmental assessments. For areawide plans this responsibility rests with the State designated regional or local planning agencies. For projects the applicant communities have the responsibility. Assessments for plans and projects are submitted to the State for review prior to submittal to EPA for review and approval.

EPA Regional staff responsible for approving waste treatment plans and facilities grant applications use the assessment and supporting planning and project documents to determine whether a detailed environmental impact statement is necessary.

If EPA determines an impact statement is necessary, EPA independently prepares a draft statement using the applicant's assessment as the source of information and analyses. To achieve early participation of experts and citizens, EPA issues a "Notice of Intent" to file an impact statement. Although EPA assumes responsibility for the statement, it may request assistance from the applicant. It circulates the draft statement for review and comment by federal, state, regional and local agencies and the public (including the Council on Environmental Quality). The reviewing agencies and public have a minimum of 45 days (plus a 15-day extension, if they so request) in which to submit their comments on the draft statement.

EPA evaluates the comments received, modifies the proposals if necessary, and prepares a final statement. It submits the final statement together with the verbatim comments to the Council on Environmental Quality, to the reviewing agencies and organizations, and to other interested parties. CEQ regulations require release of the final statement at least 30 days before action on the plan or project. EPA will consider fully the views of all concerned in its decisions.

If EPA determines an impact statement is not necessary, it will use the assessment as the basis for a negative declaration and environmental impact appraisal. The negative declaration will notify all interested parties of EPA's determination. The supporting appraisal describes the proposed EPA action, its expected environmental impact, and the basis for EPA's conclusion that no significant impact is anticipated. Because it is a public information document, this appraisal shall be available for inspection in EPA's regional office records.

#### Planning, Project, and Assessment Sequence

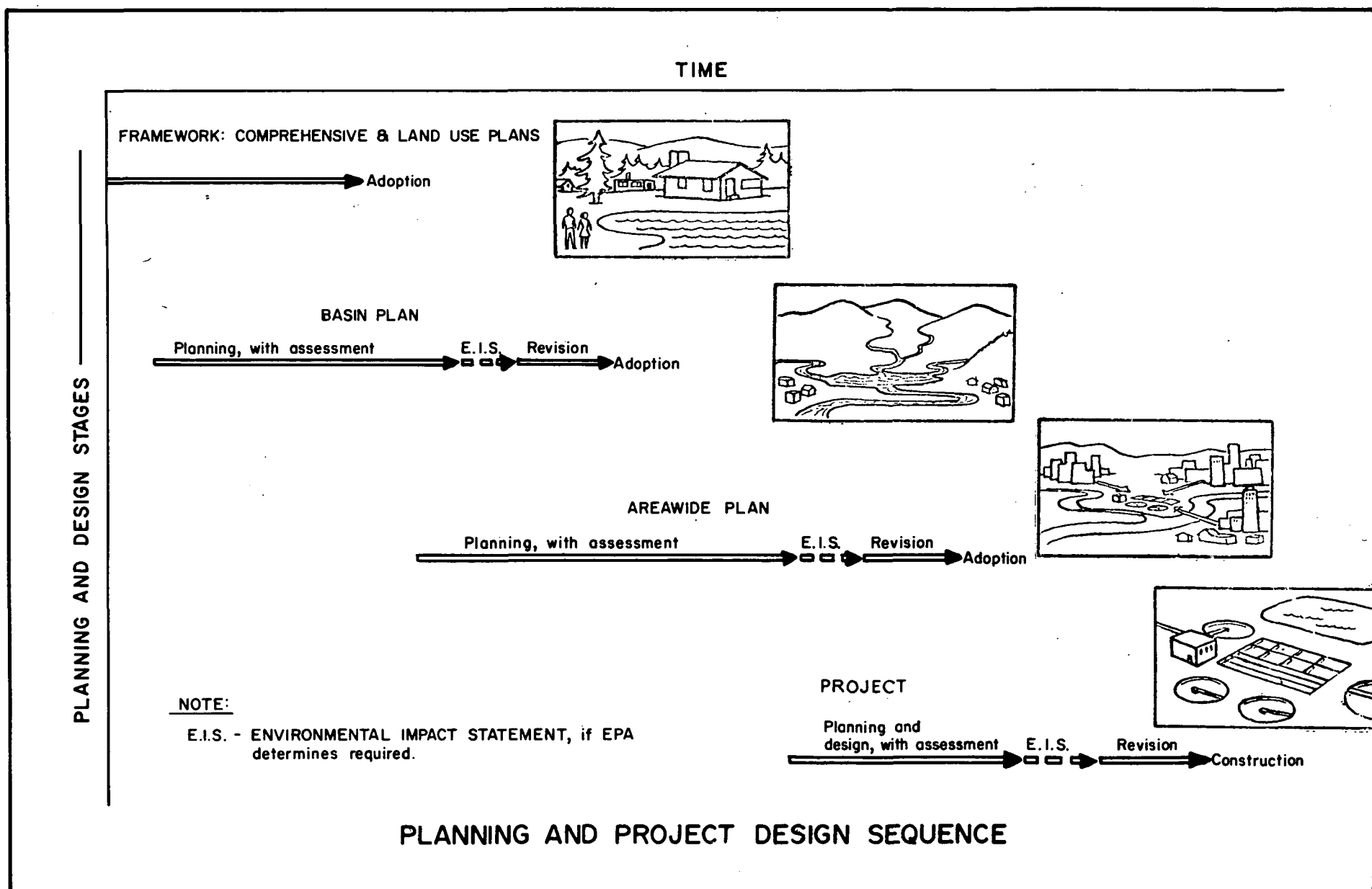
All parties in the planning - States, regional and local planning agencies, consultants, as well as Federal agencies - shall evaluate environmental effects of the full range of alternatives at the earliest stages of planning and project development. They shall improve planning methodology, use interdisciplinary expertise, weigh intangible as well as tangible values, and analyze in detail specific gains and losses to the environment of each alternative.

As Figure 1 outlines, planning must be done in a coordinated sequence, from general planning to specific project development, to assure early consideration of broad environmental effects of general location policies as well as specific effects of project siting and design. This ideal planning and environmental assessment sequence is as follows:

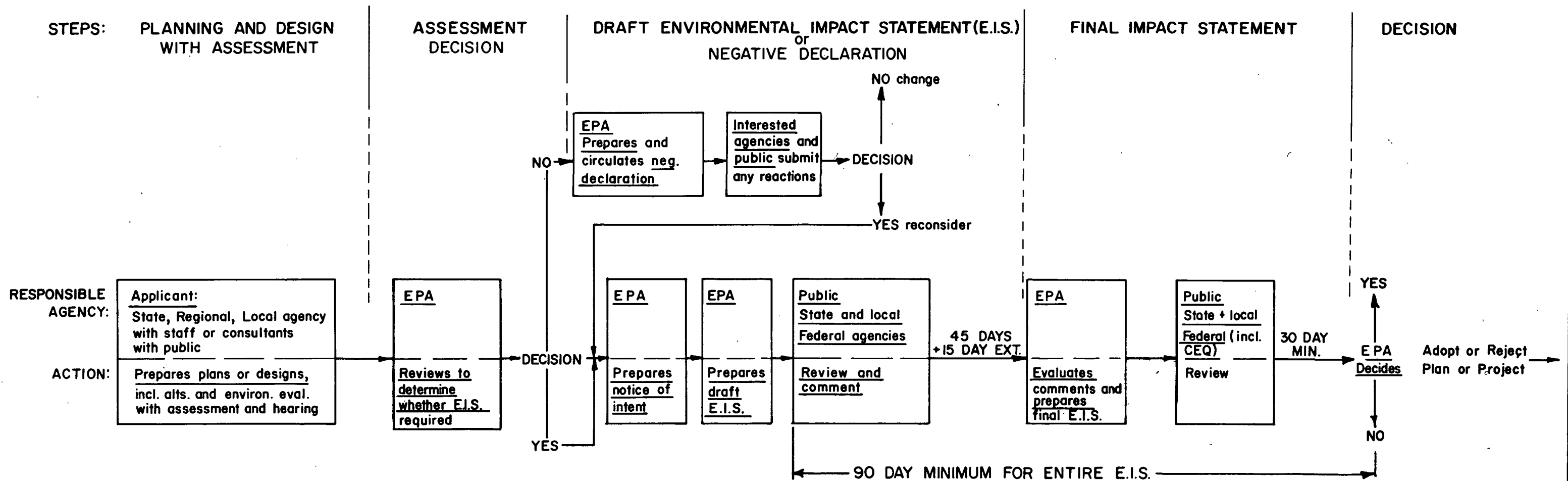
Comprehensive plans outline the broad development and conservation objectives and land uses. They provide the framework for more specific functional plans: basin and areawide water quality management plans, transportation plans, and recreation plans.

Basin and areawide plans analyze the needs, evaluate alternative measures, and propose implementation programs for water quality management. They evaluate the effects of proposed alternatives on specific environmental elements and on development and conservation objectives outlined in the comprehensive plans. They evaluate environmental effects of levels of treatment, of plant locations and configurations, of induced development, and of nonpoint sources.

Project designs specify the measures to carry out the basin and regional plans. They pinpoint environmental considerations



**FIGURE 1**



FLOW OF ENVIRONMENTAL PLANNING, ASSESSMENTS, AND IMPACT STATEMENT

in specific sites, layout, detailed engineering design, architectural and landscape design, construction practices, and operation and maintenance procedures.

### Breadth and Depth of Planning and Related Assessments

The breadth and depth of the assessment is geared to the stage in planning. Factors affecting the breadth and depth of analysis include:

- generality vs. specificity of the proposal
- geographic extent
- complexity of primary and secondary effects
- cumulative effects
- future ramifications.

The proposal must be sufficiently broad to give perspective, cumulative effects and ramifications. At the same time, the analysis must be sufficiently narrow to focus on the relevant details at critical decision points. More general early plans and their assessments establish the framework for initial screening of environmental effects, feasibility, general location, design levels, and priorities. They lend perspective for later analysis of siting and design details of specific projects within a plan. As these project details develop, individual projects will, in turn, require assessments.

The outlines for environmental assessments presented in Section III of these guides present the logical thought process of environmental evaluation from the comprehensive plans, through the basin and areawide plans, to specific projects. The checklists presented suggest detailed considerations under each environmental element to include in this planning and project development, and to distill in the assessment.

If the plan is properly formulated and documented, the planning report should contain the elements of a thoughtful environmental evaluation and assessment. Environmental assessment, then, becomes a tool to be used early in the planning before alternatives and positions crystallize. This will forestall or mitigate adverse environmental impacts of the plan, prior to project construction. Formal environmental assessments and impact statements distill and document this analysis, pinpointing the critical issues for the decision makers.

### Responsibilities for evaluation, assessment, and impact statements

1. EPA as proposing Federal agency is held responsible for impact statements under NEPA. EPA is responsible for financial/technical assistance and approval of basin and areawide plans and construction grants.

2. State environmental agencies have prime responsibility for planning and construction grant applications. As an integral part of planning and project development, they develop detailed environmental information and evaluation for the plans, projects and assessment of environmental issues for EPA use. States are responsible for full participation and coordination with agencies and experts having expertise in environmental and socio-economic evaluation.

State planning agencies serve as A-95 clearinghouses to solicit comments of other State agencies on pending proposals (including environmental effects) and to give them an opportunity to comment on any impact statements prepared.

3. Regional and local agencies work with States in developing plans and projects, including detailed environmental evaluation and assessments for EPA impact statements. Regional agencies may assume lead in areawide plans; local agencies may play key role in area project development as well as participation in regional planning.

4. Consultants may be used to develop detailed environmental information and evaluations under contract and direct guidance from States, regional agencies and localities. Consultants develop inter-disciplinary capability and work with diverse agencies and organizations having environmental and socio-economic expertise.

5. Environmental organizations and citizens assist in formulating conservation and development goals in planning; in alerting local, regional and State agencies to environmental and aesthetic factors; in evaluating alternatives; and in reviewing plans and projects, including accompanying assessments. They express preferences and value judgments. They comment on impact statements and negative declarations.

Public information meetings and systematic consultation provide an informal vehicle for exploring objectives with the public and eliciting public reactions on alternatives and proposals. Public hearings provide a formal mechanism for recording and evaluating public views.

## PUBLIC PARTICIPATION

The Federal Water Pollution Control Amendments of 1972 and EPA policy require Federal and State officials to seek out and involve the public at the preliminary stages and in the continuing development of plans and projects (as well as other water pollution control regulations, standards, effluent limitations and enforcement actions). The public can offer value judgments, set goals, identify environmental issues, evaluate alternatives, and help work out implementing organizational and financial arrangements.

Each plan and project application shall contain a "Summary Report on Public Participation" documenting the actions taken to involve the public. Such actions include (but are not limited to) public information materials and releases, technical and educational assistance to public groups, notification lists of environmental groups, systematic consultation with citizen groups, adequate public notification, full and timely public disclosure under Freedom of Information laws, and public meetings and hearings. The report should cover the disposition of major issues raised by the public.

The public participation report should include a record of public meetings and/or hearings. The record should contain, as a minimum, a list of witnesses, the text of each presentation, and a statement that the participants were informed that one of the purposes of the meeting and/or hearing was to discuss the environmental effects of the proposed plan/project and alternatives.

The potential grantee must give sufficient notice to the public of meetings and/or hearings at least thirty (30) days prior to the date. "Sufficient notice" must include:

(1) Official notice to the public by prominent advertisement identifying the plan/project, giving the date, time and place of the meeting and/or hearing, and announcing the availability of detailed information on the proposed plan/project for public inspection in at least one location in the area in which the plan/project will be located. "Detailed information" shall include, as minimum, a complete description of the plan/project, cost and financing information, alternatives, the environmental effects of each alternative, including a detailed description of the effects on land use. The notice must contain a statement that one of the purposes of the meeting and/or hearing is to discuss the potential environmental impacts of the project and alternatives to it.

(2) Notification to the appropriate State and local agencies and to the appropriate State and metropolitan clearinghouses.

(3) Notification to interested environmental and conservation action groups.

The record of the public meeting and/or hearing shall include (1) a copy of any advertisement published, broadcast, or otherwise issued; (2) a list of those notified; and (3) a certification that the meeting and/or hearing was held in accordance with the notice.

PREPARATION AND REVIEW OF ENVIRONMENTAL ASSESSMENTS  
FOR WATER QUALITY MANAGEMENT PLANS AND  
MUNICIPAL WASTEWATER TREATMENT FACILITIES

Environmental considerations are to be incorporated into the formulation of all water quality management plans and into the design and construction of all municipal wastewater treatment facilities. Water quality management plans shall integrate all environmental factors into evaluations of alternative water quality management strategies, in accordance with the EPA "Water Quality Management Planning Guidelines," January 1971, and subsequent draft guidelines under the Federal Water Pollution Control Act Amendments of 1972. Facilities shall be designed and constructed using the "Federal Guidelines - Design, Operation and Maintenance of Wastewater Treatment Facilities," September 1970. These Guides supplement existing Guidelines by elaborating upon environmental factors that must be considered.

EPA requires planning agencies and facilities grant applicants to submit a written environmental assessment with each plan or project application. The assessment must evaluate and document the effects of the proposed plan or project on all aspects of the environment. To develop an environmentally sound and acceptable plan or project, environmental factors must be fully considered throughout the planning and project formulation. If such environmental evaluation is incorporated into the substance of the plan or project, the planning or project report should contain the components of an environmental assessment. The assessment, then, should be a complete, concise and accurate distillation of these environmental considerations. The assessment should discuss the environmental impact of the proposed plan or project and feasible alternatives as well as public response.

Because of the subjective nature of such a comparative analysis of alternatives, the views of the affected public (environmental/conservation groups and individuals) must be considered throughout the course of plan or project formulation. Maximum practicable public participation is fundamental to the eventual success of all plans and projects. To assist the applicant identify environmental issues sufficiently early to avoid possible major modifications at a later date, public meetings and/or hearings should be held.

In conjunction with the final Title II Construction Grant Regulations issued February 11, 1974, the construction of Federally financed waste treatment works is generally accomplished in three steps:

- 1) Step I Grant - A grant for preparation of a facilities plan. Facilities planning consists of reports and studies which are directly related to the construction of wastewater treatment

works for a defined planning area. A facilities plan demonstrates the need for the proposed facilities and, by a systematic evaluation of feasible alternatives, demonstrates that the proposed measures represent the most cost-effective means of meeting established effluent and water quality goals, while giving full recognition to environmental and social considerations. The plan should conclude with a preliminary design for the selected treatment works.

- 2) Step 2 Grant - A grant for preparation of construction drawings and specifications. An approved facilities plan is required before a Step 2 grant can be awarded.
- 3) Step 3 Grant - A grant for fabrication and building of a treatment works. Both an approved facilities plan and construction drawings and specifications are required before a Step 3 grant can be awarded.

The following are the procedures that must be followed in applying NEPA to the Title II Construction Grants Program:

- 1) An environmental assessment statement is not required for the awarding of a Step 1 grant as the environmental evaluation is an integral part and major tool of the facilities planning process. The environmental evaluation, together with the monetary cost evaluation and consideration of various systems' ability to meet environmental goals, will comprise the major analysis of alternatives which finally results in the selection of a facilities plan.

The impact of each alternative on the environment must be evaluated with a notation of significant impacts and failures to meet environmental goals or constraints. The noted impacts may require further study. Adverse impacts could be a basis for rejecting an option, thus reducing the number of alternatives. Major impacts and reasons for option rejection should be indicated.

If a number of related facilities plans are submitted to EPA in conjunction with applications for construction grants, approval of these plans and awarding of grants may be delayed until the plans can be reviewed together to allow EPA to properly evaluate their cumulative impact.

Ideally the facilities plan will serve as an environmental assessment, and a separate assessment document will not be necessary. However, for a lengthy facilities plan it may be desirable to prepare a separate environmental assessment to summarize the highlights of the plan.

- 2) An environmental assessment statement must be included with an application for a Step 2 grant. NEPA procedures must be completed prior to the award of a Step 2 grant, except that a facilities plan may be approved and a Step 2 grant awarded prior to completion of an impact statement when the Regional Administrator determines that excessive costs would be incurred if award of a Step 2 grant were delayed pending completion of the statement.
- 3) An environmental assessment statement must be included with an application for a Step 3 grant. However, if the NEPA procedures have been completed for a Step 2 grant for the project, it will not be necessary to re-submit an environmental assessment except when the project or its impact has changed significantly from that specified in the approved facilities plan.

Following are suggested outlines and checklists for preparing an assessment for a water quality management plan (including alternatives) and for a municipal wastewater treatment facility. The planning checklist raises broad environmental issues, considered at the early planning stage: development and conservation objectives, induced development, treatment levels (in relation to standards and uses), regional waste treatment facility configurations, general location, and proximity to other land uses. The project checklist, in turn, details more specific environmental considerations: siting and alignment issues, layout, engineering design, architectural and landscape design, construction practices, operations and maintenance, and scheduling.

In cases where the plan assessment does not present relevant environmental issues or detail, the project assessment must include them.

If all environmental factors are fully considered and documented in the plan, a summary assessment, cross-referenced to the plan report, will be adequate. Likewise, if the grant application is supported by a detailed engineering report containing an updated environmental evaluation of the project, a summary assessment cross-referenced to the engineering report will be acceptable. If the plan or engineering report is not sufficiently detailed, a more detailed environmental assessment statement will be required.

## Outline for Environmental Assessments for Water Quality Management Plans

### Plan Identification

Name and Location of Plan:

Submitting Agency:

Address:

State Certification (official and date):

Brief Plan Description:

Following Council of Environmental Quality (CEQ) Guidelines, cover the following major points (specific issues raised are suggestive rather than all-inclusive):

#### I. Plan Background.

A description of the proposed action, including information and technical data necessary for environmental evaluation.

Describe planning area, population and growth goals, water quality problems, resource objectives or constraints, present waste treatment facilities (including residual disposal) and management programs. Include maps. If not enclosed, identify supporting references and documents.

#### II. Summary of Alternative Solutions.

Delineate alternative solutions and the principal features of each. Summarize types of measures (both facilities and regulations), regional configurations, locations, capacities, capital and operating costs over the planning period, and completion dates of the main components of each plan.

Alternatives to the proposed action. Conduct imaginative search for alternatives as integral part of early planning and project development. Explore range of potential alternatives to proposals creating adverse effects. For example: Have reuse, recycling, process change been considered? Technological advances? Land use regulation and zoning? Evaluate alternative of taking no action.

Evaluate rigorously for each alternative quantifiable and nonquantifiable costs, environmental impact, economic and social effects, technological feasibility. Analysis should enable reviewers to judge independently their relative desirability.

### III. Detailed Environmental Evaluation of Each Alternative.

Conduct a detailed environmental evaluation of each feasible alternative, applying the following items:

A. The probable impact of the proposed action on the environment, including impact on ecological systems. Describe both short and long term impacts. Discuss physical changes to the project area, alterations to ecological systems, changes in land development or zoning and shifts in population distribution and concentration which might be induced by the project. Outline the time frames in which these impacts are anticipated. Evaluate measures to prevent, eliminate, reduce or compensate for any environmentally detrimental aspect of the proposed action.

The following are a number of resource and other evaluation considerations.

#### 1. Resource considerations:

- a. Specific resources affected and their interrelationships? (Natural, historic, cultural; role in ecosystem.)
- b. Significance of resources? Relative scarcity and scale? National, regional, local significance? Significance in comprehensive and master plans?
- c. Contribution to diversity of resources in an area and opportunities for a variety of experiences and tastes?
- d. Specific effects on such resources as air, water, landscape or setting?
- e. Specific problems in solid wastes, pesticides, radiation, noise?

## 2. Evaluation considerations:

- a. To what degree will proposal meet standards for maintaining or enhancing quality--including uses, criteria, schedules, and nondegradation or enhancement policies?
- b. How will sequence and timing affect environment?
- c. In addition to the primary effects (direct degradation) what will be secondary effects--such as adverse patterns of land development, water uses, or demands for public services?
- d. In addition to the impact of the permanent measures themselves, what will be effects of their construction, installation, operation and maintenance procedures?
- e. Will proposals generate toxic or hazardous materials?
- f. Adequacy of monitoring and surveillance?
- g. Adequacy of emergency provisions?

B. Any probable adverse environmental effects which cannot be avoided. Describe the kinds and magnitudes of adverse impact which cannot be reduced in severity or can be reduced to an acceptable level but not eliminated. Focus on adverse consequences with which technology cannot cope.

C. The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. Assess the cumulative or long-term effects and risks. Consider reduction or enhancement of the future environment. Include ultimate site development. Evaluate the broader regional, national or international interest. Weigh localized gains against long-term widespread losses, or vice versa.

D. Any irreversible and irretrievable commitments of resources. Describe the extent to which the proposed action curtails the diversity and range of uses of the environment. Assess irreplaceable ecosystems or natural areas, and adverse land use patterns. Identify health and safety hazards. Consider long-term contamination by toxic wastes. Examples of potentially committed resources are (1) the proposed project sites and (2) the opening of areas to further development, committing future generations to similar uses.

#### IV. Comparison of Alternatives and Selection of Proposed Project.

Summarize comparison of environmental effects of alternative solutions. Highlight ecological factors. Include pertinent social and economic effects. Outline impact of recommended selection. Figure 3 suggests a convenient format for summarizing the costs and environmental pros and cons of each plan alternative. Quantify where relevant, but also use succinct narrative.

#### V. Agencies and Public Consulted.

Problems and objection raised by other Federal, State and local agencies and by private organizations and individuals in the review process and the disposition of the issues involved.

Outline extent proposal has been coordinated with:

- Federal, State, regional and local environmental agencies, laws, and regulations?
- Regional, metropolitan, statewide, and basin planning agencies?
- Environmental organizations and citizens?

Indicate Federal, State and local agencies and organizations that have been involved in the development of the project. Include agencies that have jurisdiction or expertise in planning, water quality, water supply, solid waste management and air quality, parks, recreation, fish and wildlife. If necessary, also consult noise, radiation, and pesticide control agencies. Submit comments received from these agencies.

Present "Summary Report on Public Participation."

Discuss:

- Results of all public meetings and/or hearings.
- Source and nature of all written or other comments indicating opposition.
- Steps taken to resolve conflicts.
- Remaining unresolved conflicts.

FIGURE 3 . SUMMARY OF PROS/CONS OF PLAN ALTERNATIVES

Alternate	Capital Cost	Operating Cost During Design Life	Present Value All Costs	Adverse Environmental Effects	Beneficial Environmental Effects	Reasons Why Alternate is Desirable	Reasons Why Alternate is Undesirable

## Checklist of Environmental Evaluation Factors For Water Quality Management Plans

The following list of environmental evaluation factors provides guidance to the preparers and reviewers of environmental assessments for water quality management plans. Any other environmental issues associated with the plan should also be covered.

### Water Quality

1. Does the plan present a reliable solution for meeting water quality standards and goals throughout the planning area? Describe the probable effect on water use classifications, numerical criteria, and implementation schedules. Outline relationship to emerging uses, future goals, and proposals to upgrade classifications.
2. Does the plan recognize all reasonable point and non-point sources, hydrologic conditions, and conditions peculiar to the area such as freezing?
3. Will treatment levels and pollution prevention measures be sufficiently high and comprehensive to meet present standards? Future goals?
4. What liquid discharges will result (or remain) from this plan? Consider all pertinent effluent characteristics. Discuss BOD, solids, color, turbidity, pH, temperature, nutrients, chemical constituents, metals, toxics, radioactivity, grease and oils. Consider leachate from solid waste disposal areas.
5. What beneficial and adverse effects will plan implementation have on aquatic biota and habitats? Evaluate species composition, limiting factors, and productivity.
6. What physical effects will plan implementation have on hydrology? Include effects on water levels, high and low-flow conditions, mixing and stratification, temperature, salinity, sediments, and nutrients.
7. If spray irrigation is proposed or considered, what are its effects on the hydrological patterns of the basin and on both surface and ground water quality?
8. If interbasin transfer of wastewater effluent is considered, what environmental effects would such a transfer have on the waters of each basin?
9. What measures will be taken to prevent erosion and siltation?

### Water Supply

1. How and to what extent will the plan affect the quality or quantity of any existing or potential, public or private water supply - including watersheds, reservoirs, and groundwater? Include effects of induced development and land runoff in the watershed.
2. If there is a local groundwater depletion problem, has groundwater recharge of treated wastewater been considered, and its effects evaluated?
3. If local water demand is high and supply low, has water reuse been considered? What effects would these water reuse measures have on meeting both water quality and quantity needs?

### Solid Waste

1. What quantities and types of solid waste will be generated? How will they be handled? (Handling here refers to storage, collection, transportation, processing and ultimate disposal.)
2. What is the potential for utilizing or recycling solid wastes at present and in the future?
3. Will handling of solid waste affect water, air or other environmental factors? Have alternative sites or methods been fully explored?
4. Discuss relative environmental effects. Will methods comply with EPA guidelines and State and local plans and regulations for solid waste management?

### Air Quality

1. How will the total emissions resulting from implementation of the plan affect the ambient air capacity within the planning area? Discuss relation to Federal, State and local air quality standards. Consider effects of topography and meteorology.
2. What is the relationship of treatment plant locations and prevailing wind patterns to nearby residences, businesses, and recreation areas?
3. Has the growth in emissions been projected to determine whether air quality standards will be maintained. Has generated growth as well as normal growth been considered?
4. How will maintenance of standards be monitored?

### Radiation

1. Does the plan cover discharge of radioactive material to the environment? Account for major sources and their control measures. Consider possible reconcentration through food chains.
2. If applicable, what surveillance programs, records, and emergency plans are proposed?
3. If applicable, have plan and specific radiological controls been coordinated with responsible Federal, State and local officials?

### Noise

1. Are any noise problems anticipated due to operation of the facilities proposed in the plan? Consider time of occurrence, duration, intensity impact and possible control.
2. Where facilities may generate noise, have existing and projected noise levels been measured or estimated?
3. Will noise levels comply with existing or proposed regulations?
4. Has noise from present operations or similar projects generated adverse conditions? Have there been any complaints?
5. If significant noise may result, have State and local noise agencies been contacted and comments obtained?

### Land Use

1. How does the plan relate to areawide comprehensive and land use plans? To conservation plans (recreation, open space, fish and wildlife, water conservation, air quality, solid waste management plans)? To development plans (transportation, utilities, housing)? Discuss consistency of the water quality management plan with the HUD sponsored comprehensive plans or planning in process for the area. If there is no HUD comprehensive plan, discuss consistency with the State or locally developed land-use plan.
2. Would implementation of the water quality management plan induce urban development or land uses consistent with the development and conservation plans of the area? Would it strive for a balance between population and the capacity of the renewable resources?

Planning Guide - A planning premise should be that every area has an ultimate environmental carrying capacity beyond which degradation occurs. Balance resource use and availability; balance scale of land development and land capability; balance intensity of development and capacity of the setting to sustain numbers of people or concentrations of use and economic activity.

3. What environmental effects might induced development in turn produce? Evaluate effects of point and non-point sources generated by additional urban or resort development resulting from interceptors and treatment facilities. Consider prospect of improved water quality stimulating additional waterside development and, hence, need for land use regulations or further water quality control measures.
4. Does the plan support adopted or proposed zoning, subdivision controls, tax policies, and other land use regulations? Is current land zoning consistent with the comprehensive or land use plans available or being formulated? Has citizen participation been encouraged in State or local planning and zoning efforts?
5. Will land use plans for public acquisition in fee or easements and zoning protect public access, banks and setting to sustain the water uses sought in the standards and goals?

Planning Guide - Relate scheduling of water quality measures to that of land use policies to insure public access to the waters and protection of banks and setting.

6. Are locations of interceptors and treatment facilities compatible with present and proposed land use in the surroundings?
7. What direct effects would the proposed facilities or measures have on the site or alignment? Discuss types and amounts of land that would be irreversibly used by facilities included in the plan. For spray irrigation strategies, would the irrigated lands have greater social value for other uses?
8. Have alternative facility sites been considered and were environmental factors recognized in site selection?
9. Have adequate facility sites been reserved and protected for plan implementation? Are site locations, topography, and size adequate for future expansion? Do the sites permit enough land to develop buffer areas to screen the projects?
10. Has the plan considered possibilities for coordinated planning and acquisition of lands and easements for multiple use of sites and nearby areas?

Planning guide - Coordinate planning for waste treatment facilities with master planning for recreation and open space areas. Preserve open space corridor along stream valley. Acquire streamside lands, public rights-of-way, recreation areas, and scenic easements in conjunction with interceptors. This might embrace opportunities for trail access to stream valleys and waterside recreation areas.

#### Recreation, Historical, Cultural and Aesthetic Values

1. How will location, construction, and operation of facilities or measures affect existing and potential park and recreation areas, open spaces, natural areas, and scenic values?
2. How will plan affect historical, archeological, and cultural sites? What measures have been taken to protect these values? Consult National Register of Historic Places and discuss how any effects on these properties were taken into account. What measures will be taken to protect these sites?
3. What will be the visual impact of location and siting of facilities and measures? Have facility locations been selected to minimize visual impacts upon the landscape? If facility sites are located in areas of natural scenic beauty, what measures will be taken to protect these areas?

Planning guide - Conceal rather than locate facilities where they intrude upon the scene. Locate in concealed valley, rather than on key promontory or headland, or in commercial-industrial zones rather than natural areas. Avoid locating across from areas of special interest or use.

4. Will architectural and landscaping techniques be included in the individual facilities?

Planning guide - Harmonize proposed architectural and landscaping styles, color, texture, and materials with physical, historic, and cultural setting.

5. What would be visual impact of any induced development?

Planning guide - Adopt zoning and subdivision controls to assure that any induced development contributes to attractive community and setting.

## Social and Economic

1. How will plan contribute to areawide social and economic objectives?

Planning guide - Serve or guide development to meet areawide and community social and economic objectives. Maintain conservation areas and low density residential character of community. Serve a range of income groups, including the poor and minorities.

2. Will plan implementation require relocation of people, disrupt employment opportunities, or impair public services? Include actions covered by Uniform Relocation Assistance and Land Acquisition Policies Act of 1970.

Planning guide - Respect the needs of the poor and minorities, avoid locations in ghettos merely to protect upper and middle class neighborhoods. Minimize relocation of people or employment opportunities, especially the poor, minorities, or otherwise disadvantaged. Minimize disruption of public services such as transportation and utilities.

3. If considerable urban growth would occur as a result of the plan implementation, what consideration was given to developing the necessary sewerage services as well as other services and public utilities to serve such growth in a timely manner?
4. Is sequence and timing of plan elements scheduled in relation to timing of desired development and conservation objectives and provisions of other public services?

Planning guide - Schedule planning, financing, construction and operation to synchronize with other supporting public services, transportation, utilities, and schools to serve induced development. Schedule development inducing facilities, especially interceptors, so that the supporting planning, zoning, subdivision controls, and hook-up regulations are in force prior to project operation. To avoid speculation, try to adopt regulations prior to announcement.

5. To what extent are proposed expenditures consistent with other state and local priorities? Consider both direct expenditures for capital investment and operation and maintenance as well as indirect expenditures for additional public services required by induced development.

### Construction

1. Has planning considered overall effects of proposed construction insofar as probable effects are known and relevant to evaluation of alternatives and recommendations?
2. How will proposed construction sites and practices relate to land forms, soil types, vegetation and fish and wildlife?
3. Will construction pose particular erosion or sedimentation problems?
4. Will proximity of construction sites to residences or businesses cause possibility of nuisances?

## Outline for Environmental Assessments for Municipal Wastewater Treatment Facilities

### Project Identification

Name of Applicant:

Address:

EPA Project Number:

Project Location:

Brief Project Description:

### I. Project Background

Describe the project service area, pertinent waste treatment management plans, conformity to any studies that have been done on the project area by State, Federal or private organizations, and present and future wastewater treatment needs with a discussion of development and population trends in the project area. If not enclosed, identify supporting references and documents.

### II. Summary of Alternative Project Solutions

Delineate alternative solutions and the principal features of each. Discuss alternate sites and regionalization--giving, for each alternate, facility sizes and capabilities, capital and operating costs and completion dates. Evaluate alternate interceptor routing and ultimate sludge disposal methods. The alternative of taking no action and continuing with the existing situation should also be evaluated. Alternatives must be analyzed in such a manner that reviewers independently can judge their relative desirability.

### III. Detailed Environmental Evaluation of Each Feasible Alternative

The evaluation must consider environmental effects during operation and construction.

A. Probable impact on the environment (complete listing of beneficial and adverse effects). Describe both short and long term impacts. Discuss physical changes to the project area, alterations to ecological systems, changes in land development or zoning and shifts in population distribution and concentration which might be induced by the project.

Include the time frames in which these impacts are anticipated. Evaluate measures to prevent, eliminate, reduce or compensate for any environmentally detrimental aspect of the proposed action. Adverse impacts which cannot be substantially avoided will be considered in greater detail in the next section.

B. Adverse effects which cannot be avoided should the proposed project be implemented. Describe the kinds and magnitudes of adverse impacts which cannot be reduced in severity or which can be reduced to an acceptable level but not eliminated. Some specific factors to consider are: wooded or wildlife habitat which will be lost with the project; stream or downstream impoundment siltation due to project construction; disruption of the natural setting; and the impact of the additional quantity of flows and associated residual pollutants upon the receiving bodies of water.

C. Relationship between short-term beneficial uses versus long-term environmental consequences. Describe the cumulative or long-term effects of the proposed action which either significantly reduces or enhances the state of the environment for the future. Consider ultimate site development.

D. Irreversible and irretrievable commitment of resources. Describe the extent to which the proposed action curtails the diversity and range of uses of the environment. Assess irreplaceable ecosystems or natural areas and adverse land use patterns. Examples of potentially committed resources are (1) the project site and (2) the opening of areas to further development generally commit future generations to similar uses.

#### IV. Environmental Comparison of Alternatives and Selection of Proposed Project

Compare the environmental effects of alternative solutions. Highlight ecological factors and include pertinent social and economic effects.

To consolidate the significant considerations on which alternatives were evaluated, the analysis in this section and that in Section II should be summarized and presented on a form like that shown in Figure 4. The form provides a place to indicate the cost of future modifications if they can be reasonably estimated at this time. As indicated in Column 5, all costs should be reduced to their present value.

V. Agencies Consulted About the Project

Indicate Federal, State and local agencies that have been involved in the development of the project. Include agencies that have jurisdiction over or expertise in planning, water quality, water supply, solid waste management, air quality, parks, recreation, fish and wildlife. Also, if necessary, consult pesticide, noise and radiation control agencies. Submit comments received from these agencies.

VI. Opportunity and Extent of Public Participation

Present "Summary Report on Public Participation." Discuss:

- A. The results of all public meetings and/or hearings pertaining to the project.
- B. The source and nature of all written or other comments received by the Grantee that indicate opposition to the project.
- C. The steps taken to resolve conflicts.
- D. Remaining unresolved conflicts.

FIGURE 4. SUMMARY OF PROS/CONS OF PROJECT ALTERNATIVES

Alter- nate	Capital Cost	Operating Cost During Design Life	Cost of Future Modifications	Present Value All Costs	Adverse Environmental Effects	Beneficial Environmental Effects	Reasons Why Alternate is Desirable	Reasons Why Alternate is Undesirable

## Checklist of Environmental Evaluation Factors for Municipal Wastewater Treatment Facilities

The following list of environmental evaluation factors provides guidance to the preparers and reviewers of environmental assessments for individual projects. The assessment should address all of those factors contained in the list that are pertinent to the project. Other environmental issues associated with the project may exist and should also be covered in the assessment.

### Water Quality

1. How does the project conform to the waste treatment management plan(s) for meeting water quality standards or objectives? Discuss effects on water use classifications, criteria and implementation schedules, including the treatment of combined sewer overflows and stormwater.
2. What are the existing (if applicable) and proposed effluent characteristics? Discuss BOD, solids, color, turbidity, pH, temperature, chemical constituents, nutrients, metals, toxics, radioactive material, grease and oil.
3. What beneficial and adverse effects will the project have on aquatic biota and habitats?
4. What physical effects will the project have on hydrology? Include effects on water levels, mixing and stratification, temperature, salinity, sediments and nutrients. If the project will contribute to increased flooding, discuss alternatives considered and measures to mitigate reduction in hydraulic capacity of the floodway or increased downstream flows. Water pollution control facilities should not be located in flood plains or intrude on wetland if there is a feasible alternate site.
5. If spray irrigation is proposed, what effect would such a project have on groundwater or surface water quality? Would such irrigation deplete stream flows during low-flow periods?
6. What measures will be taken to prevent erosion and siltation?
7. If the project will result in the propagation of insects, discuss preventative measures that will be taken to control the problem.
8. Discuss the impact of treated effluent, pump station overflows and bypasses, and combined sewer overflows on shellfish growing areas. Indicate the size and shape of buffer zones.

9. Will the project site require filling that will affect the hydraulics of a stream? For projects in flood plains evaluate the effects on the stream for the 25, 50, and 100 year floods.

#### Land Application of Wastewater

1. Land Use

- a. Current use of land to be used for application
- b. Current and proposed future zoning and land use of adjacent areas
- c. Proximity to current and planned development areas
- d. Availability of land for expansion
- e. Provisions for buffer zones

2. Climate

- a. Rainfall analysis including quantities and seasonal distribution
- b. Effects of storm intensities on runoff potential
- c. Temperature analysis including seasonal variations
- d. Evapotranspiration rates
- e. Humidity effects on evaporation and plant growth
- f. Wind analysis including velocity, direction, seasonal variations and frequency
- g. An analysis of snow conditions with respect to depth and period of snow cover.

3. Topography

- a. Ground slope
- b. The topography of land adjacent to the site. The effects of storm runoff, both from adjacent land onto the site and from the site onto adjacent lands and surface water bodies.
- c. Predict the erosion potential of the site and adjacent land; indicate required corrective action
- d. Flood potential of disposal area
- e. The extent of clearing and field preparation

4. Soil Characteristics
  - a. Physical and chemical characteristics
  - b. Infiltration and percolation potential
  - c. Evaluate renovation and percolation potentials of underlying soil layers. Locate lenses or constraints to flow
5. Geological Formations
  - a. Type and description with formations which may provide short circuits to the groundwater noted and thoroughly investigated
  - b. The depth to bedrock and formations containing discontinuities
  - c. Earthquake potential
6. Surface Water
  - a. Proximity to surface water
7. Groundwater
  - a. Depth to groundwater
  - b. Direction and rate of groundwater flow; determine whether the groundwater will come to the surface, be intercepted by a surface water, or join another aquifer.
  - c. Depth and extent of existing or potential perched water
  - d. Quality
  - e. Current and planned use including the quality requirements for these uses
  - f. Location of existing and potential wells, both on site and adjacent to the site
  - g. Seasonal variation of water table in existing wells
8. Receiving Water (other than groundwater)
  - a. Type of body
  - b. Current use
  - c. Existing quality
  - d. Prescribed water quality standards and effluent limitations
  - e. Water rights

### Water Supply

1. How and to what extent will the project affect the quality and quantity of any existing or potential public or private water supply - including watersheds, reservoir and ground-water? Will this project directly or indirectly pose health risks to consumers of public or private water supplies? Consider the effects of development on surface runoff in the watershed.
2. If there is a groundwater depletion problem, has groundwater recharge been considered and its effects evaluated?
3. If local water resource demand is high and supply low, has water reuse been considered? What effects would such reuse measures have on meeting water quality needs in the receiving waters?

### Social and Economic

1. Will project require relocation of people, disrupt employment opportunities, or impair public services? Include actions covered by Uniform Relocation Assistance and Land Acquisition Policies Act of 1970. Discuss social and economic effects of social disruption.

Planning guide - Avoid locations in ghettos merely to protect upper and middle class neighborhoods. Minimize relocation of people or employment opportunities. If relocation is necessary, arrange for relocation opportunities. Minimize disruption of public services such as transportation and utilities.

2. If the project will induce growth upon the service area, discuss the effects of such growth on the community. Will other public services and utilities be available to serve such growth when it occurs?
3. Discuss the economic impact of construction and operation and maintenance expenses on the community.
4. Discuss the source and quantity of fuel and power requirements for treatment facilities and pump stations.

### Recreation, Historical, Cultural and Aesthetic Values

1. How will siting, construction, and operation of the project affect existing and potential park and recreation areas, open spaces, natural areas, and scenic values? Discuss how the project will affect recreational opportunities in the area due to changes in water quality, location of facilities near parkland, etc.

2. How will project affect historical, archeological, or cultural sites? Consult National Register of Historic Places and discuss how any effects on these properties were taken into account. What measures will be taken to protect these sites?
3. What will be the visual impact of the project? Have facility sites been selected to minimize visual impacts upon the landscape? Are project sites located in wooded areas, open spaces, or other areas of recognized aesthetic value? If so, what alternatives were considered and what measures will be taken to minimize project effects on these areas?

Planning guide - Conceal rather than site facilities where they intrude upon the scene. Site in concealed valley rather than on key promontory or headland, in commercial-industrial zones rather than in natural areas. Avoid siting across from areas of special interest or use. Lay out structures perpendicular to the river or shoreline rather than longitudinal (and obtrusive) to the river scene. Site back from the shorelines, behind vegetation or rock outcroppings.

4. What architectural and landscaping techniques will be used to blend the structures with the surrounding area?

Planning guide - Harmonize proposed architectural-landscaping styles, color, texture and materials with physical, historical and cultural setting. Where possible, design the elevations, height, and layout of structures to blend with natural contours, tree cover, and rock formations. Choose color and texture to blend with surrounding rock and vegetation. Choose style that harmonizes with surroundings, either blending or appropriately contrasting.

#### Land Use

1. How will the proposed project encourage or discourage residential, commercial, and industrial growth within the service area? Will interceptor locations and system capacity induce growth in undeveloped areas or concentrate population in developed areas? Will they be located and scheduled to avoid inducing development in conservation areas, recreation areas, and wetlands?
2. Discuss the method(s) used for estimating future populations and industrial development.

3. How will the project effects on growth conform with federal, state, or local land-use plans for the area? Would such growth appear consistent with the growth goals of the area and the community? When changes in population patterns and growth are significant, their effect on the resource base, including land use, water quality and quantity, air quality, and public services, should be determined.
4. How will the project affect the land-based ecosystems near the facility site, such as wildlife habitat, stream bank cover, and vegetal and wooded growth on rights-of-way?
5. Would the project impair the landscape and/or create irreparable damage to geological formations?
6. What types and amount of land will be affected permanently by construction and operation of the project?
7. Have alternative sites for project structures or interceptor alignments with lesser adverse impact upon the environment been considered?
8. Has consideration been given to restricting future development adjacent to the treatment plant site and interceptors through land acquisition, zoning subdivision, hook-up controls, or other land use policies?
9. Has sufficient land been acquired (in fee or easement) or zoned for future expansion needs, such as tertiary treatment and increased capacity for ultimate design year? Consider prospective higher use standards, higher level of "maximum feasible treatment", and re-use concepts. Is buffer area sufficient to screen project and reduce any odor or noise?
10. Do site planning and layout take advantage of opportunities to develop waterside recreation areas, trails, and buffer zones?

#### Solid Waste

1. Grit, screenings, and scum
  - A. Quantities
  - B. Procedures for storage, processing, transportation, and disposal

## 2. Sludge Disposal

A. Quantity and characteristics of sludge

B. Dewatering method

C. Stabilization method

D. Method of ultimate disposal

### 1. Sludge utilization by land spreading or sludge disposal by landfilling

- a. Location, area, owner and operator of site
- b. Location of site with respect to developed areas. Existing and expected future use of surrounding areas.
- c. Past and present uses of site
- d. Future use of site if not for sludge utilization or disposal
- e. Capacity and useful life of site
- f. Application method and rate
- g. Permeability and pH of soil at point of application
- h. Depth to fissured rock and highly permeable gravel
- i. Quality, use and distance to groundwater in the disposal area
- j. Proximity to surface water
- k. Method of controlling surface water runoff
- l. Precautions to control odors and insects
- m. Frequency of earth cover and material to be used
- n. For utilization for agricultural purposes
  1. Type of vegetation to be grown. Ultimate consumer(s) of cultivated crops
  2. Public health control measures to be utilized

- o. Provisions for storage and/or disposal during periods when site cannot be used due to weather or other reasons
- p. Local and State agencies that have reviewed site
- q. Emergency disposal procedures should regulatory agencies close site
- r. Proposed program to monitor site
- s. Method of transportation to site
  - 1. Types of vehicles
  - 2. Facilities available for cleaning transportation equipment
  - 3. Local and State permits required for hauling sludge
- t. Types of equipment for handling sludge at disposal site and provisions for furnishing it

## 2. Ocean disposal

- a. Because ocean disposal of sewage sludge is strictly controlled by EPA and is subject to strict regulations and criteria, preparers of environmental analyses documents must coordinate their preparation closely with EPA's staff. Therefore, specific factors for consideration will not be presented in this document but will be delineated on a case by case basis.

## 3. Dried sludge as a fertilizer or soil conditioner.

- a. A detailed discussion of the proposed market. Proposed method of disposal if dried sludge cannot be marketed as originally intended.

## 4. Incineration

- a. Incinerating sewage sludge is an environmentally acceptable method of sludge disposal. However, the process does require a thorough evaluation of the impact on air quality in the project area. In addition the incinerator ash must be handled in an environmentally acceptable manner. The criteria for an air quality analysis is presented

in the Air Quality section. With regards to the incinerator ash the quantity, moisture content, disposal method, disposal area, and method of transportation to the disposal area must be discussed. Basically, the items under 2.D.1. above should also be applied in the analysis of ash disposal.

As the solid waste problem is constantly becoming more acute, the EPA Region I office is requesting that applicants for construction grants submit detailed information regarding sludge handling and disposal. A format for presentation of the information required is given in Appendix A.

### Air Quality

1. What is the relationship of the project site and prevailing wind patterns to nearby residences, businesses and recreation areas? Consider potential odors from treatment facilities and pump stations.
2. If odor problems can be expected from the project, what precautions will be taken to minimize this effect?
3. Sludge incineration - Before approving grants for the construction of sewage sludge incinerators, EPA, as the agency primarily concerned with the environment and its effect on the public health, requires that the impact on air quality of sludge incineration be completely and correctly assessed. Obviously, the suitability of sludge incineration for final disposal at a wastewater treatment plant will depend upon the environmental and economic suitability of alternate means of sludge disposal, and some consideration of this must enter an assessment of the impact of sludge incineration on air quality. The following questions, however, can be used to exclude sludge incineration from consideration under certain circumstances, indicated by an affirmative answer to the following:
  - A. Referencing measured pollutant levels in the area, are National Ambient Air Quality Standards for TSP, SO<sub>2</sub>, or NO<sub>2</sub> currently being approached or exceeded?
  - B. Citing applicable Federal, State, or local air pollution control regulations, will any conditions of air pollution exist (e.g., violations of Federal NSPS, State air quality standards, etc.)? What measures will be taken to comply with such regulations?

- C. Do the results of diffusion modeling of the proposed plant indicate that any long or short term National Ambient Air Quality Standards will be exceeded because of its operation? (Cite incremental increases in TSP, SO<sub>2</sub>, and NO<sub>2</sub>.)
- D. Will the sludge incinerator emit any toxic substance (e.g., lead, mercury, PCB's, etc.) that may have an adverse effect on the environment or the public health? (If this is a potential problem, cite probable emissions of each substance and countermeasures that will be used for its suppression.)
- E. Will any public nuisance condition (e.g., from odor, smoke, fugitive dust, or a steam plume) result from operation of the sludge incinerator? (If so, reference countermeasures to be employed.)
- F. Could failure to obtain adequate supplies of auxiliary fuel or of auxiliary conforming fuel cause either a substantial increase in the incinerator's impact (C above), production of an unacceptable residue, the appearance of nuisance conditions (E above), or an increase in toxic emissions?

If the above can all be answered negatively, there exists no single reason for rejecting final sludge disposal by incineration because of its effect on the ambient air. It may sometimes be the case, however, that a combination of effects on air quality (e.g., "moderate" increase in TSP with possible heavy metals emissions in an area of borderline air quality) will act to discourage the use of sludge incineration. Such conditions must be evaluated together and on a case by case basis.

To enable an adequate review of any assessment and to enable the reviewer some discretion in interpreting results, assumptions and methods used in completing the air impact study must be clearly indicated. Without such information, there is no assurance that all relevant points have been consistently and reasonably considered. Necessary information (keyed to the above questions) and a format for its presentation is given in Appendix B. Preparation of this material would logically be done by the engineering consultant for the project as it should, by and large, require little additional work.

### Noise

1. Have existing noise levels in the project area been measured or estimated?

2. Has noise from present operations or similar projects generated adverse conditions? Have there been any complaints?
3. Discuss noise or vibrations from the proposed project giving special attention to generators and air compressors. Operating frequency, length of operating time, and intensity levels in decibels should be indicated.
4. What control measures will be used? Indicate where silencers, mufflers, or insulated casings will be utilized.
5. Indicate how the noise levels will comply with existing or proposed regulations.

#### Radiation

1. Does the project involve any collection and discharge of radioactive material from industrial or commercial sources or hospitals? If so, account for the sources and their measures of control.
2. If appropriate, what surveillance programs, records, and emergency plans are proposed?
3. If appropriate, have project and radiological controls been coordinated with responsible Federal, State, and local officials?

#### Construction

1. Identify all critical impact areas in the project area that could be affected by construction. Areas considered critical are streams, wetlands, forests, parks, steep slopes, highly erodible soil, natural and man-made drainage facilities, and water recharge areas.
2. Discuss the effects of the construction on aquatic life and wildlife in the area.
3. For all stream crossings discuss the construction methods that will be used for each. Discuss special procedures that will be followed for streams that are critical to fish life cycles.
4. For all construction in streams requiring review and approval from the Army Corps of Engineers, indicate the status of their review.
5. What erosion and dust control measures will be taken during construction? Will these procedures preclude sedimentation and turbidity in the nearby waters?

6. Specify areas which will be temporarily or permanently cleared. How will disruption of land forms and clearing of vegetation and wooded cover be restricted? What provisions will be made to restore the construction site to its preconstruction condition?
7. Discuss disposal of land clearance wastes including identification of disposal site(s). Indicate if herbicides, blasting, or burning will be required. Discuss the environmental effects of the proposed method(s).
8. For fill operations, indicate quantities and sources of material.
9. Describe the extent of inconveniences or nuisances to residences or businesses in proximity to the construction site of the treatment facility and/or along interceptor route.
10. Discuss the traffic procedures that will be used specifying any local time limitations on maintaining open trenches. Include effects of increased truck traffic due to a large fill or excavation operation.
11. What measures will be taken to abate construction noise?

INFORMATION FORM

SLUDGE HANDLING AND DISPOSAL

1. Applicant \_\_\_\_\_
2. Project Location (Street, City, County, State) \_\_\_\_\_  
\_\_\_\_\_
3. Type of Facility:        New \_\_\_\_\_    Expansion \_\_\_\_\_    Upgrading \_\_\_\_\_
4. Description of Facilities: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Initial:        Year \_\_\_\_\_    Flow (MGD) \_\_\_\_\_    Population Served \_\_\_\_\_  
Design:        Year \_\_\_\_\_    Flow (MGD) \_\_\_\_\_    Population Served \_\_\_\_\_
6. Sludge Treatment at this facility (check applicable items)
- |                              |                                    |
|------------------------------|------------------------------------|
| _____ Sludge Digestion       | _____ Sludge Lagoons               |
| _____ Sludge Thickening      | _____ Multiple Hearth Incineration |
| _____ Elutriation            | _____ Fluidized Bed Incineration   |
| _____ Vacuum Filtration      | _____ Heat Treatment               |
| _____ Centrifugal Separation | _____ Other (Specify)              |
| _____ Lime Recalcination     | _____                              |
| _____ Sludge Drying Beds     | _____                              |

7. Sludge storage

Describe method of storage and equipment used. Include storage prior to dewatering, prior to volume reduction (if applicable), prior to haul to disposal facility and storage during any emergency conditions.

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8. Quantities and Characteristics of Dewatered Sludge Produced at Facility

	RAW		DIGESTED		(Other-Specify)	
	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>
Primary	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
(Secondary-Specify)	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Mixed P&S	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Chemical/Physical	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
(Other-Specify)	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

9. For chemically precipitated or conditioned sludge:

a. Indicate chemicals used 

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b. Are any of these recovered? 

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 If yes, indicate which ones and percent recovered 

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10. Quantities of (\_\_\_\_Wet, \_\_\_\_Dewatered) sludge to be incinerated (if applicable)

	RAW		(Other-Specify)	
	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>
Primary	_____	_____	_____	_____
<u>(Secondary-Specify)</u>	_____	_____	_____	_____
Mixed P & S	_____	_____	_____	_____
Chemical/Physical	_____	_____	_____	_____
<u>(Other-Specify)</u>	_____	_____	_____	_____

11. Sludge Transport

a. Describe method of transport and number and types of vehicles used.

Include transport from storage to processing, if at another plant, storage to disposal and/or processing to disposal \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

b. Are local or state permits for hauling sludge required? \_\_\_\_ If yes, include a copy of the requirements for this permit.

12. Ultimate Disposal

a. Indicate method(s) of ultimate disposal for sludge or ash from incinerated sludge.

\_\_\_\_ Land Spreading                      \_\_\_\_ Other (Specify)

\_\_\_\_ Sanitary Landfill                      \_\_\_\_\_

\_\_\_\_ Ocean Disposal

12. b. Sludge or ash requiring disposal

Quantity: \_\_\_\_\_ C.Y./WK

Moisture Content: \_\_\_\_\_ %

c. For land spreading, complete the following:

1) Indicate the type(s) of sludge disposed of by land spreading:

wet sludge \_\_\_\_\_; dewatered sludge \_\_\_\_\_; ash from incinerated  
sludge \_\_\_\_\_

2) Indicate quantities of sludge disposed of by land spreading.

If more than one type of sludge is disposed of by land spreading,  
as indicated in (1) above, supply quantities for each: (specify  
units)

	RAW		DIGESTED		(Other-Specify)	
	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>
Primary	_____	_____	_____	_____	_____	_____
(Secondary-Specify)	_____	_____	_____	_____	_____	_____
Mixed P&S	_____	_____	_____	_____	_____	_____
Chemical/Physical	_____	_____	_____	_____	_____	_____
(Other-Specify)	_____	_____	_____	_____	_____	_____

3) Has this operation been approved by the local health department? \_\_\_\_\_

State health department? \_\_\_\_\_ Department of Agriculture? \_\_\_\_\_

State solid waste agency? \_\_\_\_\_ If yes, submit copies of approvals.

12. c. 4) Location, area & ownership of site(s) used for land spreading

<u>Street</u>	<u>Municipality</u>	<u>Area (Acres)</u>	<u>Ownership</u> <u>(Public or Private)</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

- 5) If owned other than by the municipality owning the treatment facility, have long-term contracts been negotiated for use of this land? \_\_\_\_\_ If yes, until what year? \_\_\_\_\_

\_\_\_\_\_

Submit copy of any agreements.

- 6) During what months will the land spreading operation be conducted?

\_\_\_\_\_

- 7) Describe the provision made for storage and/or disposal of the sludge during the remainder of the year \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- 8) Describe precautions to be taken to insure that sludge will not run off into nearby watercourses \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- 9) Describe precautions to be taken relative to control of odors and insects \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

12. d. For disposal in a sanitary landfill, complete the following:

1) Indicate the type(s) of sludge disposed of in a sanitary landfill:

wet sludge \_\_\_\_; dewatered sludge \_\_\_\_; ash from incinerated  
sludge \_\_\_\_

2) Indicate quantities of sludge disposed of by sanitary landfill. If more than one type of sludge is disposed of by sanitary landfill, as indicated in (1) above, supply quantities for each: (specify units)

	RAW		DIGESTED		(Other-Specify)	
	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>	<u>C.Y./WK</u>	<u>% Solids</u>
Primary	_____	_____	_____	_____	_____	_____
(Secondary-Specify)	_____	_____	_____	_____	_____	_____
Mixed P&S	_____	_____	_____	_____	_____	_____
Chemical/Physical	_____	_____	_____	_____	_____	_____
(Other-Specify)	_____	_____	_____	_____	_____	_____

3) Has this operation been approved by the local health department? \_\_\_\_  
State health department? \_\_\_\_ State solid waste agency? \_\_\_\_  
If yes, submit copies of approvals.

4) Location, area & ownership of site(s) used for landfill

<u>Street</u>	<u>Municipality</u>	<u>Area (Acres)</u>	<u>Ownership</u> <u>(Public or Private)</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5) If owned other than by the municipality owning the treatment facility, have long-term contracts been negotiated for use of this site(s)? \_\_\_\_\_  
If yes, submit copy of agreements.

6) Indicate the year at which each of the above sites will no longer be able to accept sewage sludge or ash and state reason \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7) Is (will) the disposal site (be) used for the disposal of other solid wastes? \_\_\_\_\_ If yes, will the sludge be disposed of by itself in a separate area? \_\_\_\_\_; or will it be mixed with the other solid wastes? \_\_\_\_\_.

e. If a disposal method other than land spreading or sanitary landfilling is to be used, describe it in detail, indicate the approvals obtained, and supply applicable data. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. Special Waste Handling

- a. Indicate emergency procedures for storing, transporting, processing and disposing of the contents of fouled biological treatment units such as digesters, aeration tanks, etc. \_\_\_\_\_

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- b. Will septage be accepted at the treatment facility? \_\_\_\_\_ If yes, how much? \_\_\_\_\_ and from which towns, cities, etc.? \_\_\_\_\_

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If yes, describe the receiving and handling facilities \_\_\_\_\_

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- c. If septage is not accepted, describe methods for treatment and/or disposal to be utilized by the towns, cities, etc., served by the treatment facility \_\_\_\_\_

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13. d. Have provisions been made for storing, transporting, processing and disposal of grit, screenings, and grease? \_\_\_\_\_ Indicate the quantities of such materials \_\_\_\_\_ If yes, indicate the procedures to be followed \_\_\_\_\_

14. Other Comments: \_\_\_\_\_

Suggested Content and Form for Sewage  
Sludge Incineration Air Impact Assessment

Background Material

In order to place incineration plant facilities, parameters, and air impact calculations in perspective, a fairly complete schematic of the sludge incineration system should be presented. This schematic should show:

1. Flows (@NDC = at normal design conditions)
  - A. Sludge cake: #wet/min. @NDC
  - B. Combustion and cooling air: #/min., corresponding % excess air,  $\Delta P$  and T at furnace inlet and outlet @NDC
  - C. Auxiliary fuel (include plume reheat): #/min., @NDC and max. continuous, fuel type
  - D. Ash: #/min. @NDC
  - E. Exhaust: #dry/min, #wet/min, T and  $\Delta P$  at stack exit, scrubber exit, subcooler exit, and furnace breeching @NDC
  - F. Water: #/min, T @NDC
  - G. Power: output (horsepower) of motors and fans @NDC and max. continuous
2. Components, etc.
  - A. Sludge incinerator: configuration, gross dimensions
  - B. Queneher, scrubber, demister, subcooler: types and location
  - C. Air movers and motors: type and location
  - D. (Separately-) Primary sludge cake analysis including % moisture, % combustibles (with % C, H, N, O, S), % ash, heating value of combustibles (Btu/dry#) and the expected ranges in the % moisture and % ash. Other materials that may be incinerated in significant quantities should be similarly described and the NDC case should be related to consumption of these materials.
  - E. (Separately-) Building dimensions, stack location and dimensions
  - F. Air and exhaust flow controls and operation monitors: type and location

I. Ambient Air Quality Background and Meteorology

1. On a map centered on proposed site of the sewage sludge incinerator and indicating the character (housing, commercial, industrial, etc.) and topographic features of the area, show:

- A. Location of air pollution sampling sites (or indicate compass heading and distance from site.)
- B. Location of station used for meteorological data.

2. Provide the following data relevant to the meteorology and air quality of the area:

- A. For TSP, NO<sub>2</sub>, and SO<sub>2</sub>: the annual arithmetic mean; annual geometric mean; annual arithmetic standard deviation; annual geometric standard deviation; highest value; 90, 75, and 50 percentile levels; # of samples; year of record; and method used.
- B. Available meteorological data; at least a wind direction-velocity rose.

## II. Compliance with Applicable Regulations

For each regulation cited under question 2, state whether compliance will be guaranteed under the contract specifications and indicate the basis of the guarantee (e.g., outline test results, etc. on other similar sludge incinerators).

## III. Diffusion Modeling

1. Estimation of plume rise: give the plume rise equation used and briefly state the conditions and assumptions under which it is valid. Keying all numbers to operating parameters (incinerator loading, auxiliary fuel rate, excess air, plume suppression, sludge analysis if not assumed design, etc.), give emission rates, stack exit ACFM, exit velocity, exit temperature, and, if necessary, molecular weight of exit gases.

2. Annual average predicted pollutant levels: indicate what model has been used and state how available meteorological data has been incorporated into it.

3. Worst case daily average pollutant levels: Give the method used in finding worst case pollutant concentrations (except for NO<sub>2</sub>) and describe the corresponding meteorological conditions and the probability of their occurrence. Indicate how measured background air quality has been combined with maximum incremental impact to give worst case air quality.

## IV. Toxic Emission Potential

1. Present an analysis for trace toxic materials (include toxic metals, PCB's, insecticides, etc.) that may be present in the sludge cake.

2. For each such material present in the sludge in significant concentrations, estimate the probable emissions.

3. Based on these estimated emissions, assess the potential for adverse effects on the public health or the environment. If possible, these toxic emissions or resulting concentrations of toxic materials in the air could be correlated with EPA emission standards (e.g., for mercury) or exposure guidelines (e.g., for lead).

4. If it appears that toxic emissions could be a problem, detail effective controls or procedures that will be used for their reduction.

#### V. Nuisance Conditions

For each of the following, indicate operating conditions (incinerator, treatment plant, or weather) under which a public nuisance might result. By referring to similar incineration facilities, show that there will be adequate standby controls to abate any nuisance:

1. Odor and smoke
2. Fugitive dust
3. Steam plume

#### VI. Evaluation of Disincentives for Proper Control

If adequate supplies of suitable auxiliary fuels are unavailable or if costs of such fuels discourages proper operation of the incinerator, an air pollution problem may result. Accordingly, the following information should be provided.

1. Estimate yearly average and maximum hourly use of auxiliary fuel. Break these rates down further according to
  - A. Fuel for proper sludge combustion
  - B. Fuel for afterburning (say, for odor control)
  - C. Fuel for plume reheat
2. By citing estimated fuel costs, maintenance costs, incinerator characteristics, etc. evaluate the use of heat recovery devices.