



Mayor – Sandy Sanders

City Administrator – Ray Gosack

City Clerk – Sherri Gard

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Ward 2 – Andre' Good

Ward 3 – Mike Lorenz

Ward 4 – George Catsavis

At Large Position 5 – Pam Weber

At Large Position 6 – Kevin Settle

At Large Position 7 – Philip H. Merry Jr.

# **AGENDA**

## **Fort Smith Board of Directors SPECIAL STUDY SESSION December 9, 2014 ~ 6:00 p.m. Fort Smith Riverfront Pavilion 100 North "B" Street**

*Dinner available at 5:30 p.m.*

### **CALL TO ORDER**

1. Discuss proposed consent decree regarding the sanitary sewer system  
~ *Continued from the December 1, 2014 special study session* ~

### **ADJOURN**



OFFICE OF THE CITY CLERK  
Sherri Gard, CMC, City Clerk  
Heather James, Assistant City Clerk

## **MEDIA RELEASE**

**December 2, 2014**

The City of Fort Smith Board of Directors will hold a special study session at 6:00 p.m., Tuesday, December 9, 2014 at the City of Fort Smith Riverfront Pavilion, 100 North "B" Street, for the following purpose:

- Discuss proposed consent decree regarding the sanitary sewer system  
~ *Continued discussion from the December 1, 2014 special study session* ~

For agenda information, please contact the City Clerk's Office at 784-2208. Once finalized, the agenda will be posted on the City's website, [www.fortsmithar.gov](http://www.fortsmithar.gov).

A handwritten signature in blue ink that reads "Sherri Gard".

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Sherri Gard, City Clerk

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P.O. Box 1908  
Fort Smith, Arkansas 72902  
(479) 784-2208  
FAX (479) 784-2256  
E-mail: [cityclerk@fortsmithar.gov](mailto:cityclerk@fortsmithar.gov)

**INTER-OFFICE MEMO****TO:** Ray Gosack, City Administrator**DATE:** December 5, 2014**FROM:** Steve Parke, Director of Utilities**SUBJECT:** Consent Decree Presentations

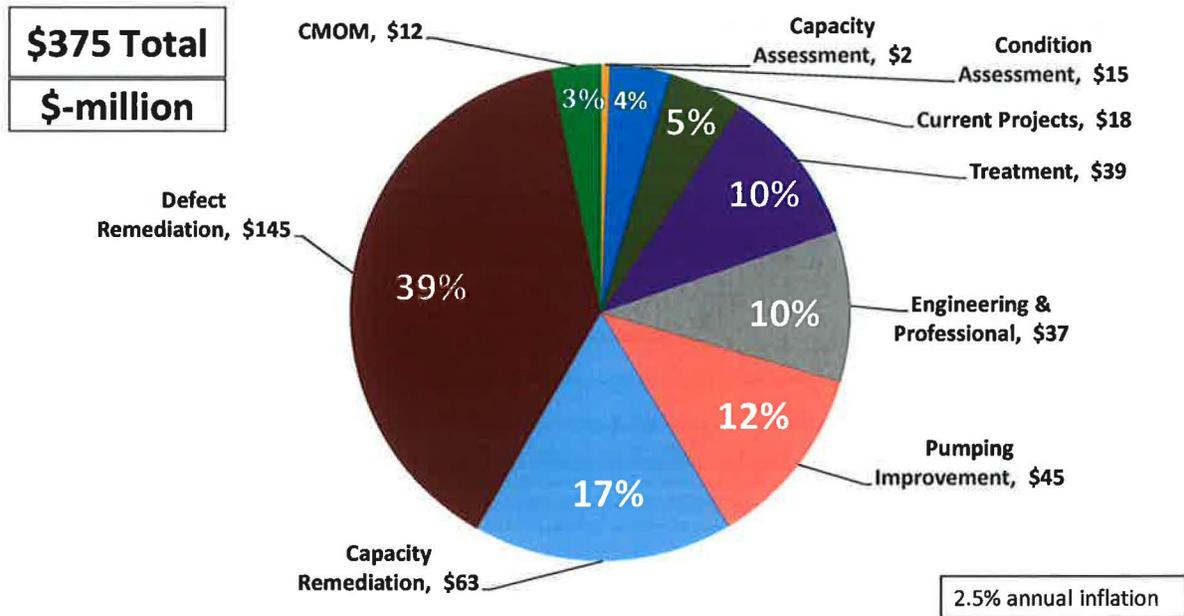
In response to the questions and requests of the Board from the December 1 study session and December 2 agenda meeting, staff has developed the attached slides which will be part of the December 9 study session presentation. There were a few additional questions related to comparisons of costs and staffing levels of other cities which we have not yet been able to receive. That information will be incorporated into the December 9 presentation if we are able to obtain it by that time.

Should you or members of the Board have any questions, please let me know.

attachments

pc: Jeff Dingman

# Estimated Capital Costs 2015-2026



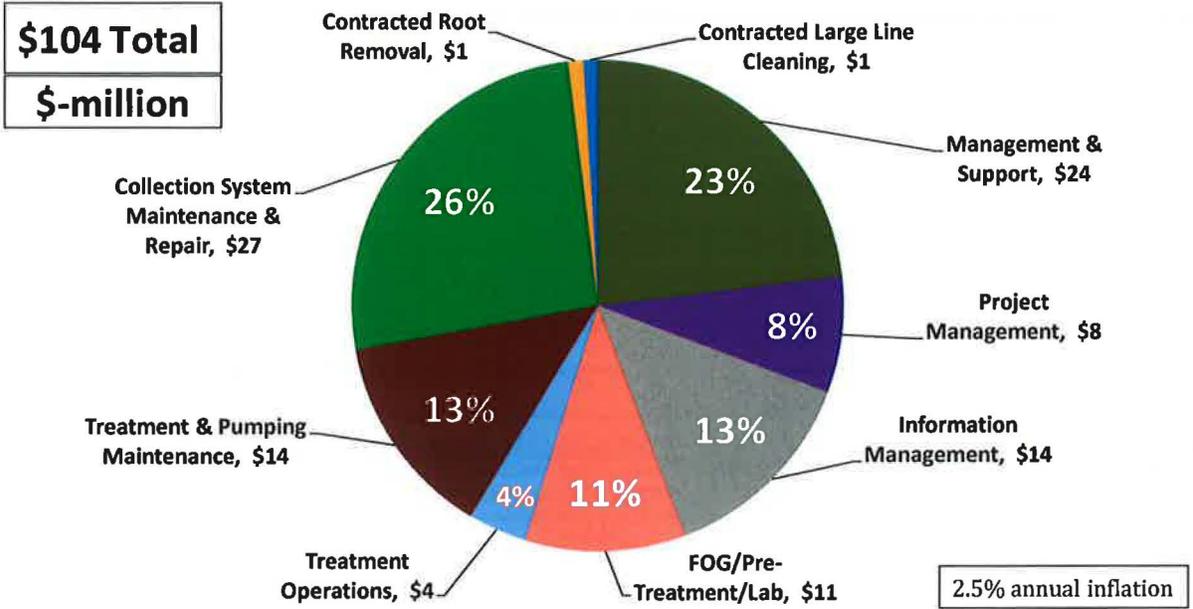
## Notes:

These costs are for capital projects, capital purchases, investigative assessments, and other one-time costs. As shown above and as part of the financial plan development, a 2.5% annual inflation rate has been applied to the engineering and project cost estimations previously presented.

The 3 identified costs from the December 1, 2014 presentation as listed below are depicted in the chart above as follows:

- Collection System Assessment included in Condition Assessment.
- Conditional Remedial Measures included in Defect Remediation.
- Capacity Remediation included in Capacity Remediation and Pumping Improvement.

# Estimated O&M Costs 2015-2026 Consent Decree



**Notes:**

These are consent decree costs for the 12-year consent decree period in addition to existing operation and maintenance activities. As shown above and as part of the financial plan development, a 2.5% annual inflation rate has been applied to the EPA affordability cost estimations previously discussed.

# CONSENT DECREE COMPARISON

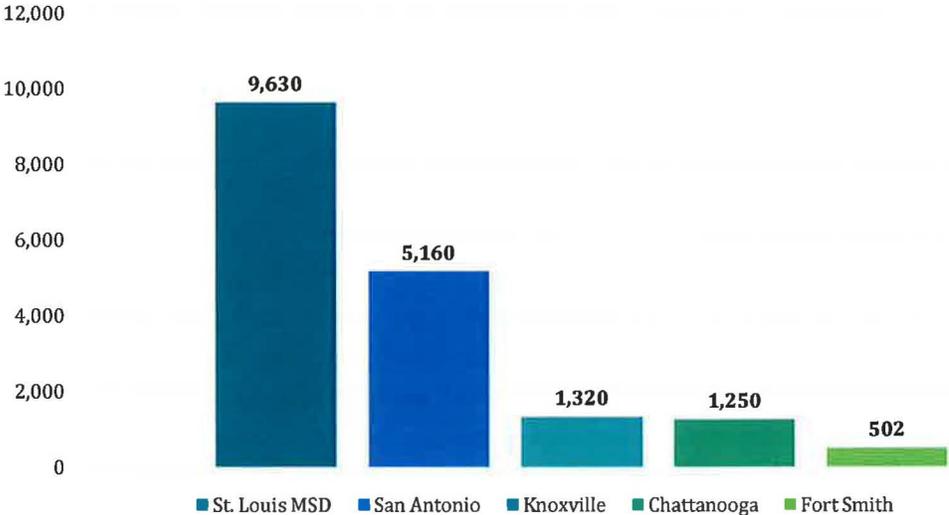


City	Date CD Filed	Negotiated or Court Ordered
St. Louis MSD	08/04/2011	Negotiated
San Antonio	07/23/2013	Negotiated
Knoxville	12/01/2004	Negotiated
Chattanooga	07/17/2012	Negotiated
Fort Smith	01/01/2015	Negotiated

# CONSENT DECREE COMPARISON



Miles of Sewer



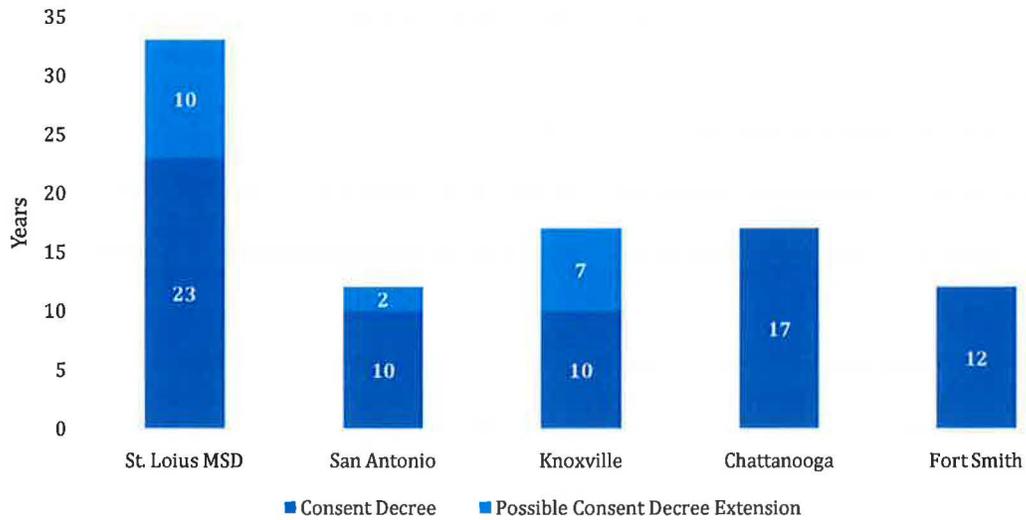
**Notes:**

The above data was collected from various websites and has not been validated or verified.

# CONSENT DECREE COMPARISON



Duration of Consent Decree



## Notes:

The above data was collected from the respective published consent decrees.

## CONSENT DECREE COMPARISON



City	FOG Program	Root Control Program	Gravity Sewer Line Cleaning	Private Service Line Defect Program	Continuing Sewer Assess Program	Pump Station Evaluation O&M
<b>St. Louis MSD</b>	✓	✓	✓	✓	✓	✓
<b>San Antonio</b>	✓		✓	✓	✓	✓
<b>Knoxville</b>	✓	✓	✓	✓	✓	✓
<b>Chattanooga</b>	✓	✓	✓	✓	✓	✓
<b>Fort Smith</b>	✓	✓	✓	✓	✓	✓

## CONSENT DECREE COMPARISON

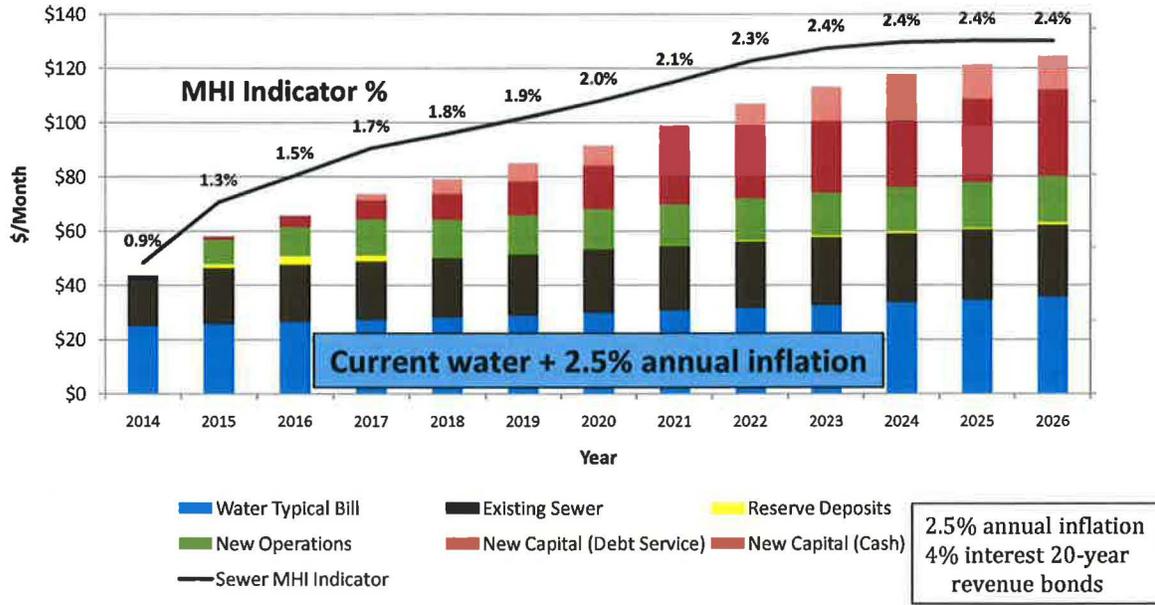


City	Continued Capacity Assurance	SSO Reporting	SSO Response Plan	IMS	SOPs & Training	Inventory Manage
<b>St. Louis MSD</b>	✓	✓	✓	✓	✓	✓
<b>San Antonio</b>	✓	✓	✓	✓	✓	✓
<b>Knoxville</b>	✓	✓	✓	✓	✓	✓
<b>Chattanooga</b>	✓	✓	✓		✓	✓
<b>Fort Smith</b>	✓	✓	✓	✓	✓	✓

Notes:

The above data was collected from the respective published consent decrees.

# ESTIMATED IMPACT ON CUSTOMER BILLS



**Notes:**

The above depicts the generally applied costs to show the order of impact for Fort Smith proposed consent decree and is not a billing recommendation or part of a rate study.



# Interim Economic Guidance for Water Quality Standards

## Workbook



"... to restore and maintain the chemical,  
physical, and biological integrity of the Nation's  
waters."

Section 101(a) of the Clean Water Act

Appendix M to the  
*Water Quality Standards Handbook - Second Edition*



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

APR 27 1995

EPA-823-B-95-002

OFFICE OF  
WATER

MEMORANDUM

SUBJECT: Economic Guidance for Water Quality Standards--Workbook  
FROM: Tudor T. Davies, Director  
Office of Science and Technology *Tudor T. Davies*  
TO: Water Management Division Directors  
Regions I - X

PURPOSE

The purpose of this memorandum is to transmit the Interim Economic Guidance for Water Quality Standards Workbook for use by the States and Regions in considering economics at various points in the process of setting or revising water quality standards.

POLICY IMPLEMENTATION:

We recommend the subject guidance, including the various screening levels and measures presented, be implemented as reference points and used as guides by the States and Regions. The measures outlined in the guidance are not intended to be applied as absolute decision points. States may use other economically defensible approaches in lieu of those suggested in this interim guidance.

This guidance is designed for use in the water quality standards program and does not represent Agency guidance outside of that program.

BACKGROUND:

Economic factors may be considered at several different points in the water quality standards program. The water quality standards regulation provides for such consideration in the following areas:

Section 131.10--Designation of Uses (also applies to variances)

(g)(6) Controls more stringent than those required by Sections 301(b) and 306 of this Act would result in substantial and widespread economic and social impact.



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## Section 131.12--Antidegradation

(a) (2)...allowing water quality is necessary to accommodate important economic or social development in the areas in which the waters are located...

Since publication of the water quality standards regulation in 1983 we have produced extensive guidance on the interpretation and application of the various regulatory requirements. None of this guidance, however, dealt extensively with the economic considerations.

This guidance workbook is intended to fill that gap. It is anticipated that the guidance will be revised from time to time to reflect State and Regional experience in its application. For example we intend to add case studies as appendices to the guidance to reflect real-world experiences in its application. In addition, the Agency is considering revising the water quality regulation. If revisions to the regulation are made with respect to economic considerations, the applicable guidance will be revised accordingly. However, it is likely to be at least 3 years before any revisions to the regulation are finally promulgated and no way of anticipating whether any changes will be made in the economic provisions.

This guidance is presented to assist States and EPA Regional Offices, along with other interested parties, in understanding the economic factors that may be considered, and the types of tests that can be used to determine: (1) if a designated use cannot be attained, (2) if a variance to an individual discharger can be granted, or (3) if degradation of high-quality water is warranted.

The regulatory requirement that must be met is that attaining a designated use or obtaining a variance would result in substantial and widespread economic and social impacts. The regulatory requirement for antidegradation is that it must be shown that lower water quality is necessary to accommodate important social and economic development. This guidance provides a framework for making these determinations.

The measures and tests suggested in this guidance are standard economic analytical tools, but the States are free to provide other kinds of analysis to support their position. The guidance does provide information on the kinds and types of analysis that are appropriate and how the information can be assembled in order to make a decision. It is not an exhaustive description of all appropriate economic analysis. Additional information and tests may be necessary and/or desirable in certain circumstances.

The economic impacts to be considered are those that result from treatment beyond that required by technology-based regulations. All economic analyses of water quality standards should address only the cost of improving the water to meet water quality standards or the cost of maintaining water quality in high-quality waters.

Although EPA is responsible for approving a State's water quality standards, the State is responsible for interpreting the circumstances of each case and determining where there are substantial and widespread economic and social impacts, or where important economic and social development would be inappropriately precluded.

Various drafts of this guidance were reviewed by EPA headquarters and regional offices, States, and other organizations. State and Regional staff should feel free to contact the Economic and Statistical Analysis Branch in the Office of Science and Technology for advice and assistance regarding this guidance or related concerns. We would appreciate receiving feedback from the users of this guidance so that it can be improved as necessary. As with all guidance related to the water quality standards program, this document is considered to be part of the Water Quality Standards Handbook--Second Edition.

cc: Lee Schroer , OGC  
Jim Pendergast, OWM  
John Meagher, OWOW  
William Painter, OPPE  
Regional WQS Coordinators, Regions I - X

75 015 3309

**INTERIM ECONOMIC GUIDANCE  
FOR WATER QUALITY STANDARDS**

**WORKBOOK**

**Economics and Statistical Analysis Branch**

**Office of Science and Technology**

**Office of Water**

**U.S. Environmental Protection Agency**

**March 1995**

U.S. Environmental Protection Agency  
Region 5, Library (PL-12J)  
77 West Jackson Boulevard, 12th Floor  
Chicago, IL 60604-3590

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# ECONOMIC GUIDANCE FOR WATER QUALITY STANDARDS

## WORKBOOK

### 1. INTRODUCTION

As presented in the Water Quality Standards Regulation, economic factors are taken into consideration at various points in the process of setting, enforcing, or changing Water Quality Standards. This guidance is presented to assist States and applicants in understanding the economic factors that may be considered, and the types of tests that can be used to determine if a designated use cannot be attained, if a variance can be granted, or if degradation of high-quality water is warranted. In order to remove a designated use or obtain a variance, the State or discharger must demonstrate that attaining the designated use would result in substantial and widespread economic and social impacts. Likewise, if a degradation in high-quality water is proposed, it must be shown that lower water quality is necessary to accommodate important social and economic development.

This workbook provides guidance for those seeking to document that uses meeting the fishable/swimmable goals of the Act are not attainable, obtain a variance based on economic considerations, or to lower water quality in a high-quality water. In addition, it provides guidance to States and EPA regions responsible for reviewing requests for variances, modifications to fishable/swimmable designated uses, documentation that fishable/swimmable uses are not attainable, and for approval of antidegradation analyses. The guidance describes the types of information and analyses that should be considered by applicants and reviewers. The guidance, however, is not an exhaustive description of appropriate economic impact analyses. Additional information and tests may be necessary and/or desirable in certain circumstances.

The economic impacts considered are those that result from treatment beyond that required by technology-based

regulations. Since water quality cannot be lower than that resulting from technology-based limits applied to direct and indirect point source discharges, these are considered to be the baseline. All economic impact analyses of water quality standards should, therefore, address only the cost of improving the water to meet fishable/swimmable uses or the cost of maintaining water quality in high-quality waters.

Although EPA is responsible for approving a State's water quality standards, the State is responsible for interpreting the circumstances of each case and determining where there are substantial and widespread economic and social impacts, or where important social and economic development would be inappropriately precluded. Each analysis of economic impacts must demonstrate:

- that the polluting entity, whether privately or publicly owned, would face substantial financial impacts due to the costs of the necessary pollution controls (substantial impacts or would interfere with development), and
- that the affected community will bear significant adverse impacts if the entity is required to meet existing or proposed water quality standards (widespread impacts or important development).

This Workbook supplements the description contained in the *Water Quality Standards Handbook*, which should be read first as it contains many important definitions and descriptions of the regulations. Specific attention should be paid to Chapters 2 (Designation of Use) and 4 (Antidegradation), which describe the context in which this guidance is to be used. This Workbook is designed as a series of worksheets and accompanying guidance to be used when actually calculating the impacts of pollution control.

The intent of this workbook is to point States and dischargers in the right direction. It does not give definitive answers as to whether or not an entity has demonstrated substantial, widespread, or important

economic and social impacts. If a State or discharger has difficulty with any part of the analysis presented in this workbook, they should consider seeking the assistance of a financial expert. In addition, State and regional EPA water quality staff should feel free to contact EPA headquarters' Economic and Statistical Analysis Branch in the Office of Water for advice and assistance.

The remaining sections of Chapter 1 provide an overview of the analysis and describe various factors and concepts that generally apply to analyzing the economic impacts of compliance with water quality standards. The following four chapters provide detailed guidance.

Throughout this Workbook, the term "financial impacts" refers to impacts on the entity or party that will pay for the pollution control, whereas the term "socioeconomic impacts" refers to changes in the social and/or economic conditions of the affected community. For public-sector entities, such as a publicly owned treatment works (POTW), substantial impacts include financial impacts on the community, taking into consideration current socioeconomic conditions. Widespread, on the other hand, refers to changes in the community's socioeconomic conditions. By contrast, for private-sector entities, substantial impacts refer to financial impacts and widespread impacts refer to socioeconomic impacts on the surrounding community. In addition, the term "applicant" refers to whomever will actually complete the economic impact analysis, whether it be the State, an individual discharger, a consultant, or some other organization.

## **1.1 Designated Uses, Variances, and Antidegradation**

Pursuant to the Water Quality Standards Regulation (40 CFR 131), States must define statewide water quality goals by: 1) designating water uses and 2) adopting water quality criteria that protect the designated uses. When designating uses, States must consider the use and value of the waterbody for public water supplies, protection and

propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. The designated use may or may not coincide with the existing use, but it cannot reflect lower water quality than the existing use. As described in the *Water Quality Standards Handbook*, if the designated use of a water body is also an existing use, the designated use cannot be downgraded to one that requires less stringent water quality criteria. If, however, the designated use is not an existing use the States may, under certain circumstances, remove the designated use, create new subcategories of the use, or grant a water quality standard.

Before a designated use is removed a State or a discharger must conduct and submit a use attainability analysis to EPA. Briefly, a use attainability analysis is an assessment of the physical, chemical, biological and, if necessary, economic factors affecting the attainment of a use. If the analysis shows that, based on any one of these factors, conditions exist which make the use unsuitable or impossible to achieve, then the State may remove the designated use.

In many cases, a designated but unattained use for a stream segment need not be removed. Instead, individual dischargers may be granted variances from the water quality standards for a limited time with the expectation that they will be able to comply with water quality standards by the time their variance expires or that an adjustment in the applicable standards is warranted. A variance is preferable to a removal of a designated use since other dischargers, who are capable of meeting the standards, must comply with the standards through their permits. In cases where a discharger can meet water quality based permit limits for some parameters, a variance would not be granted for those parameters. The variance procedure is designed to lead to the attainment of the water quality goals of the Clean Water Act within a reasonable timeframe.

States are also required to adopt an antidegradation policy to protect existing uses, high-quality waters, and

water quality in waters that are considered to be outstanding national resources. The antidegradation policy allows States to lower water quality in higher-quality waters (that are not ONRWs) only if it is necessary to accommodate important economic or social development. The use of the term "important" communicates a general sense of the level of economic and social development. Under no circumstances, may water quality fall below that required to protect existing or designated uses.

For each of the circumstances described above, the Water Quality Standards Regulation allows the applicant to take economic considerations into account. When applying for a change in a designated use or for a variance, the applicant must demonstrate that meeting the fishable/swimmable goals of the Act will cause substantial and widespread economic and social impacts. The antidegradation provision requires that the applicant demonstrate that important economic or social development would be prevented unless lower water quality is allowed. In all three cases, the same general tests of impacts are used.

## **1.2 Pollution Sources**

The choice of methods used to evaluate the economic impacts of meeting water quality standards depend, in part, on whether pollution control is the responsibility of a privately or a publicly owned entity. Since the polluting entity or party may not be the one to pay for reductions, the analyses focus on the party that pays for pollution control. Some of the more common privately owned entities include, but are not limited to: manufacturing facilities, agricultural operations, shopping centers and other commercial development, residential developments, and recreational developments. Publicly owned entities include: publicly owned sewage treatment works, roads, and other municipal infrastructure.

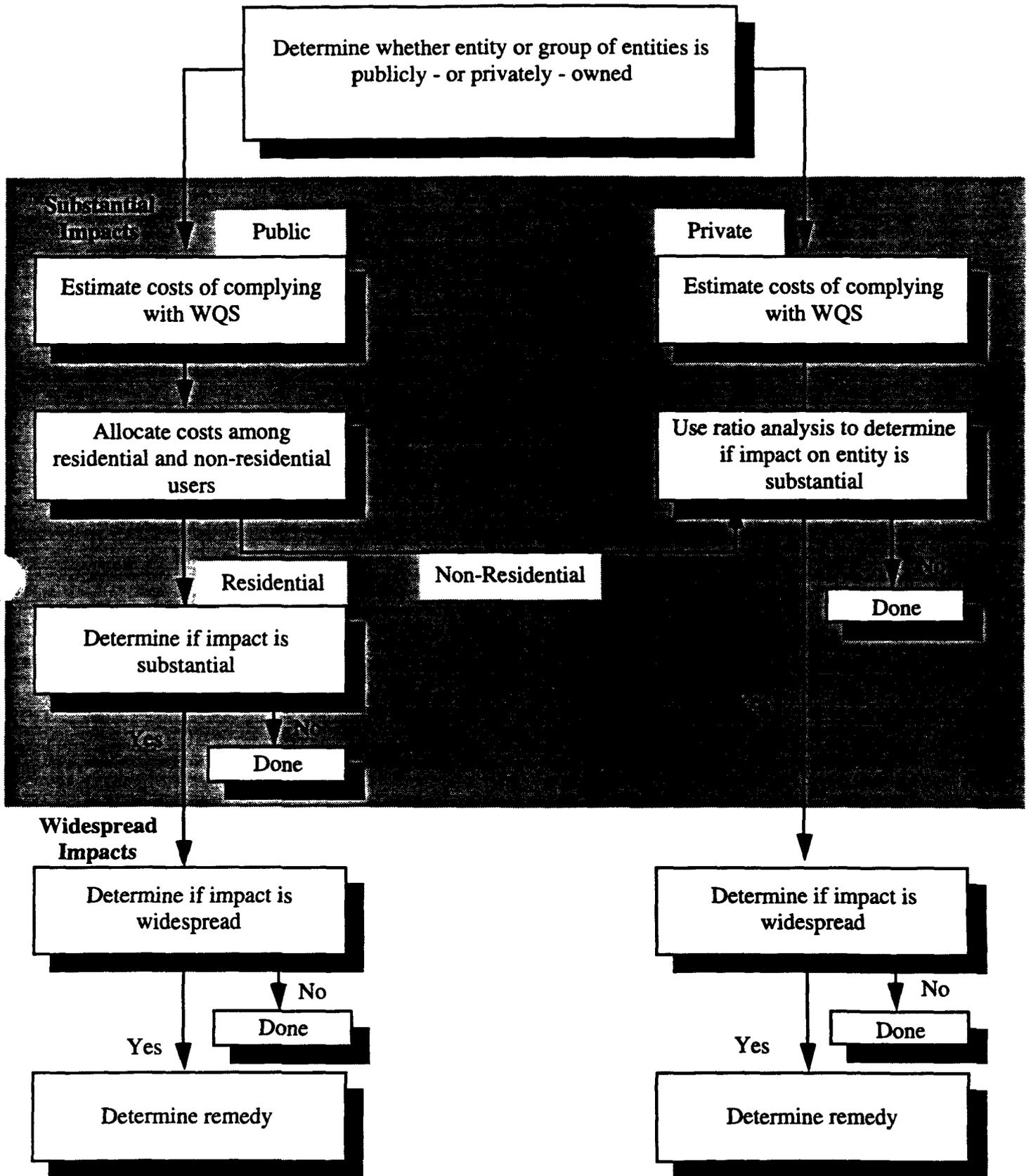
determines not only who will pay for the necessary pollution control, but also the types of funding mechanisms available. For example, in the case of a privately-owned entity, the facility can raise the money through loans and equity funds but may try to pass some or all of the cost on to the consumer in the form of higher prices. In the case of a publicly-owned entity, the community can float bonds to pay for the capital costs, with the cost of the bonds and operating expenses covered by user fees and/or tax revenues. The different impact measures are addressed in two separate chapters. Chapter Two provides guidance on public-sector entities and Chapter Three provides guidance on private-sector entities.

Whether publicly or privately owned, polluting entities can be point (direct discharge) or nonpoint (runoff and erosion) sources of pollution. Attainment of water quality standards is not limited to controls placed on point sources. Water quality standards are applicable to nonpoint sources of pollution despite the fact that there may be no direct implementation mechanisms for nonpoint sources. Although pollution control approaches used by nonpoint sources may differ substantially from approaches typically employed by point sources, analysis of the ensuing economic impacts still depends upon whether the entity providing the pollution control is privately or publicly owned.

### **1.3 Substantial Impacts**

A financial analysis of the discharger should be conducted to determine if the capital and the operating and maintenance costs of pollution control will have a substantial impact. This analysis is typically performed by the discharger and reviewed by the State, although there may be cases where the State or some other group completes the analysis on behalf of the discharger. The first step is to estimate the capital and the operation and maintenance costs of the necessary pollution control (see Figure 1-1). The second step is to determine how the entity will finance the necessary reductions. If the entity is publicly-owned (e.g. a municipal sewage treatment

**Figure 1-1:  
Steps in the Economic Impact Analysis  
Determining Whether Impacts Will Be Substantial and Widespread**



plant), the households in the community will bear the cost either through an increase in user fees, an increase in taxes or a combination of both. The burden to households resulting from total annual pollution control costs must be estimated. In addition, the financial impact analysis must consider the community's ability to obtain financing and the general economic health of the community.

If the entity is privately-owned (e.g. a manufacturing facility), the analysis should consider factors such as the entity's ability to secure financing and the degree to which it will be able to pass the cost of pollution control on to its customers in the form of higher prices. The financial impact analysis of private-sector entities employs a variety of financial ratios and tests. Some of these ratios and tests include benchmark values to help in the analysis.

Demonstration of substantial financial impacts is not sufficient reason to modify a use or grant a variance from water quality standards. Rather, the applicant must also demonstrate that compliance would create widespread socioeconomic impacts on the affected community.

#### **1.4 Widespread Impacts**

States and dischargers will need to consider the possibility that financial impacts could cause far reaching and serious impacts to the community. An important factor in determining the magnitude of these impacts is defining the geographical area affected. The affected area might be a town, city, region, county or some combination of these geographical units.

Equally important are the *types* of impacts that might occur. There are no economic ratios or tests per se to evaluate socioeconomic impacts. Instead, the relative magnitude of a group of indicators should be taken into account. For public-sector entities, the applicant will need to estimate the change in socioeconomic conditions that would occur as a result of compliance. Of particular importance are changes in factors such as median household income, unemployment, and overall net debt as a percent of full

market value of taxable property. For private-sector entities, the assessment of widespread impacts should consider many of the same socioeconomic conditions. The analysis should also consider the effect of decreased tax revenues if the private-sector entity were to go out of business, income losses to the community if workers lose their jobs, and indirect effects on other businesses.

In some instances, several entities potentially may suffer substantial impacts. For example, this situation can arise where several facilities are discharging to a stream segment that is being considered for a change in designated use. While a separate financial analysis should be performed for each facility, the impacts on all the facilities should be considered jointly in the analysis of widespread impacts.

### **1.5 Antidegradation**

As with removing a use or granting a variance, economic impacts are considered as part of an antidegradation review. While the terminology is different, the tests are basically the same. In the first case (discussed in Chapters 2, 3, and 4), a finding of substantial and widespread economic impacts can be the basis for granting a variance or changing a designated use. In the case of antidegradation, the analysis must show that maintaining "high-quality waters" will preclude important economic and social development. As such, the two cases can be thought of as two sides of the same coin. Variances and downgrades refer to situations where additional treatment to meet standards may result in declining economic and social conditions, while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation analysis, the first question is whether the costs of the pollution controls needed to maintain the high-quality water will interfere with the development. If not, then lower water quality is not "necessary" for the development to take place. If, on the other hand, the costs will interfere with the development and lower water quality is "necessary" for the

development to take place, then the analysis must show that the development would be an important economic and social development. These two steps rely on the same test as the determination of substantial and widespread economic and social impacts.

## **1.6 Organization of the Rest of the Workbook**

The remainder of this Workbook addresses the measurement of economic impacts. In Chapter 2, guidance is presented to assist applicants in evaluating financial impacts on public-sector entities. Chapter 3 presents guidance on evaluating financial impacts on private-sector entities. Chapter 4 provides a discussion of how to assess whether impacts are widespread as well as substantial. This discussion includes both public-sector and private-sector entities. Chapter 5 applies the concepts developed in Chapters 2, 3, and 4 to antidegradation.

Worksheets are included in each chapter that will assist the reader in calculating potential impacts. Chapters 2 and 3 include worksheets for: 1) estimation of annualized costs of pollution control, and 2) evaluation of the financial burden of pollution control. Chapter 4 includes worksheets that can be used in the evaluation of whether the impacts on the entity(ies) will result in widespread economic and social impacts. Chapter 5 includes worksheets for determining if important social and economic development might be lost.

In addition to presenting step by step guidance on how to estimate impacts, several of the worksheets provide benchmark comparisons that allow an assessment of the magnitude and relative importance of potential impacts. These worksheets, however, should not be used in isolation. Discussion of key sources of information, important entity and community attributes, and interpretation of results are found only in the accompanying text. Applicants, and State Water Quality staff charged with reviewing the application, should be sure to read all text accompanying the worksheets. While Chapter 2 addresses public-sector treatment requirements, if a

substantial portion of the costs of a public facility is borne by a private entity (such as a manufacturing facility that pays substantial user charge fees to a POTW), both Chapters 2 and 3 should be referred to.

In all cases, the determination of economic and social impacts must be made on a case by case basis. This determination, therefore, requires the application of good judgement as well as use of the guidance provided in this workbook. Additional information and tests may be required in order to measure the size and extent of the impacts. Applicants should be aware that they will be required to supply documentation to substantiate their claim of substantial and widespread economic and social impacts. In addition to background data, however, this documentation should include a brief written description of why the applicant believes economic and social impacts will occur.

## **2. EVALUATING SUBSTANTIAL IMPACTS: PUBLIC SECTOR ENTITIES**

Public entities seeking relief from meeting water quality standard requirements must demonstrate that the cost of required water pollution control will result in substantial impacts and that there will be "widespread" adverse social and economic impacts if they are required to meet these standards. For the purposes of this workbook, a public entity refers to any governmental unit that must comply with pollution control requirements in order to meet water quality standards. The most common example is a municipality or sewage authority operating a publicly owned treatment works (POTW) that must be upgraded or expanded. Municipalities, however, may also be required to control other point sources or nonpoint sources of pollution within their jurisdiction. The procedures outlined in this chapter apply to all types of publicly financed projects that may be required to meet water quality standards. Throughout this chapter, the term "State/discharger" refers to whoever will actually conduct the financial and socioeconomic impact analysis for the public entity, whether it be the State, the municipality, a consultant or some other organization.

The remainder of this chapter details methodologies and sources of information for determining the financial viability of publicly financed projects. Several worksheets are presented that will assist in demonstrating substantial impacts. States/dischargers are referred to Chapter 4 for guidance on demonstrating widespread impacts. Readers should keep in mind that the guidance in this chapter is not meant to be exhaustive. The State and/or EPA may require additional information or tests in order to evaluate whether substantial and widespread impacts will occur. In addition, the State/discharger should feel free to include any additional information they think is relevant.

As mentioned in Chapter 1, the evaluation of substantial impacts resulting from public entity compliance with water quality standards includes two elements, 1) financial

*Economic Guidance for Water Quality Standards*

impacts to the public entity and 2) current socioeconomic conditions of the community. Governments have the authority to levy taxes and distribute pollution control costs among households and businesses according to the tax base. Similarly, sewage authorities charge for services, and thus can recover pollution control costs through users fees. In both cases, a substantial impact will usually affect the wider community. Whether or not the community faces substantial impacts depends on both the cost of the pollution control and the general financial and economic health of the community.

If the public entity passes a significant portion of the pollution control costs along to private facilities or firms, then the review procedures outlined in Chapter 3 of this workbook should also be consulted to determine the impact on the private entities. Both public and private entities should consult Chapter 4 for guidance on how to estimate potential widespread impacts on the community.

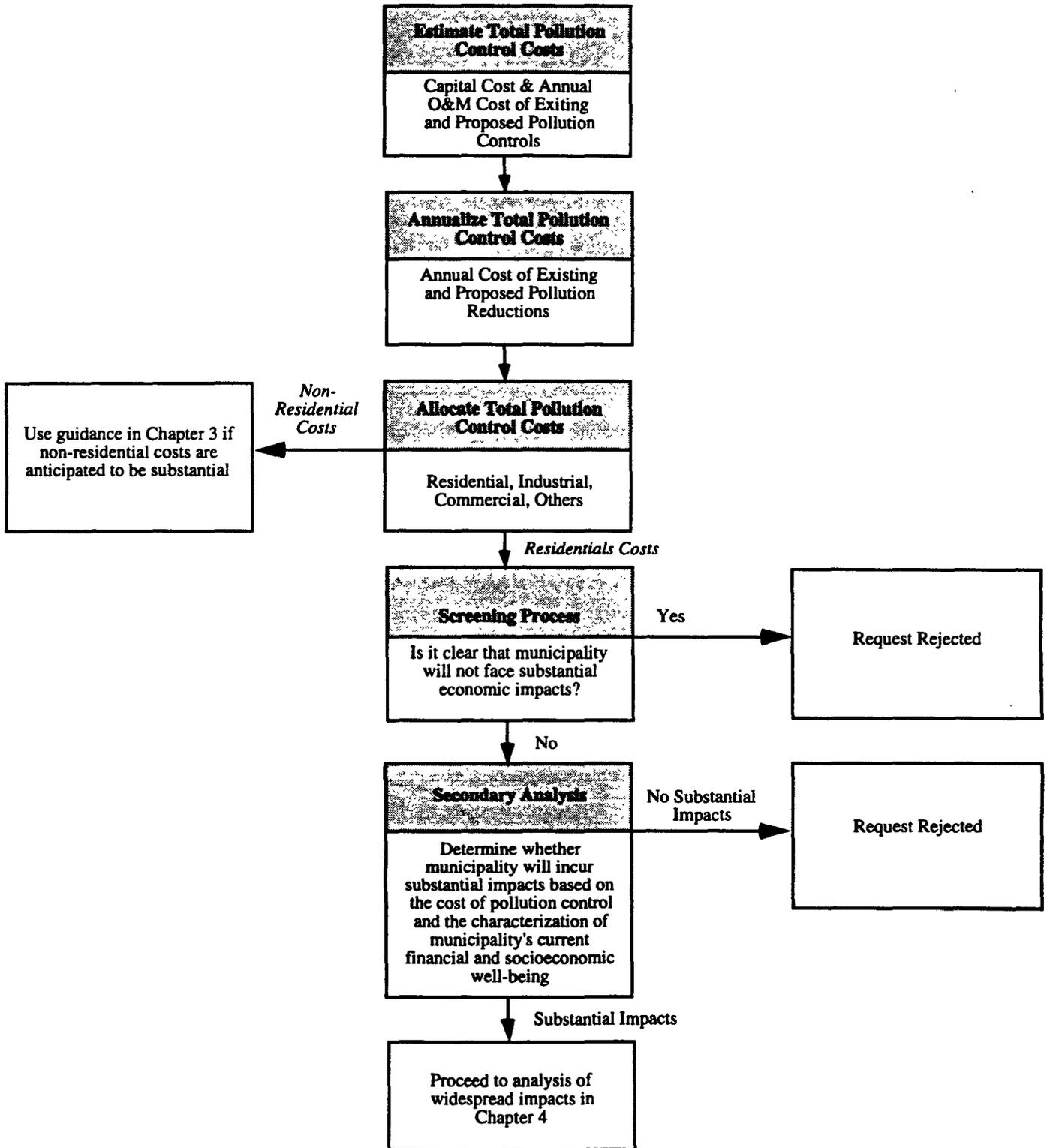
This chapter focuses on ways to determine if the costs of the proposed project will likely result in substantial impacts. To make this determination the State/discharger will need to complete a five step analysis. As shown in Figure 2-1 the first step in the process is to estimate the cost of the pollution control project and calculate the annual cost of the proposed pollution control project. The second step is to calculate the total annual pollution control cost per household, which includes the cost of the project and existing pollution control costs. In the third step, the Municipal Preliminary Screener is calculated, which quickly identifies entities that clearly will not experience substantial impacts due to the cost of the necessary pollution control. If it is not clear whether there will be substantial impacts, entities should proceed to the fourth step, which is the calculation of the Secondary Test. In this step public entities will need to provide financial and socioeconomic information. For example, the ability of the community to finance the project may depend on existing financial conditions in the community such as debt per capita and the community's bond rating. The socioeconomic health of the community prior to the

project's construction will also be an important indicator of whether the pollution control would impose a substantial impact on the community. The fifth and final step of determining whether impacts are "substantial" is evaluating where the community falls in the impacts matrix. This matrix takes into consideration the Municipal Preliminary Screener and the Secondary Test score. Later, in Chapter 4, estimated changes in socioeconomic health indicators will be reviewed to evaluate the extent to which the impacts can be considered widespread.

The remainder of this chapter is divided into five sections that detail the essential steps of an evaluation of substantial impacts for publicly financed projects. Figure 2-1 illustrates the steps and decision points in this process. The five steps are:

- **Verify Project Costs and Calculate the Annual Cost of the Pollution Control Project** - This section discusses factors that should be considered when selecting a pollution control project. It also describes the type of general information about the proposed project that should be provided. In addition, it discusses how to annualize capital costs of the project and calculate total annual costs of the pollution control project.
- **Calculate Total Annualized Pollution Control Costs Per Household** - This section outlines the calculation of total annual pollution control costs per household. The costs of the proposed project and existing pollution control are included.
- **Calculate and Evaluate the Municipal Preliminary Screener Score** - This section explains the "screener" which identifies only those communities that clearly will not face any substantial impacts.
- **Apply the Secondary Test** - This measurement incorporates a characterization of the community's current financial and socioeconomic well-being.

**Figure 2-1:  
Measuring Substantial Impacts  
(Public Entities)**



- **Assess where the community falls in The Substantial Impacts Matrix** - This matrix evaluates whether or not communities are expected to incur substantial economic impacts due to the implementation of the pollution control costs. If the applicant cannot demonstrate substantial impacts, then they will be required to meet existing water quality standards. If impacts are expected to be substantial, then the applicant goes on to demonstrate whether they are also expected to be widespread.

## **2.1 Verify Project Costs and Calculate the Annual Cost of the Pollution Control Project.**

Before the impact analysis can be performed, the project costs should be verified and then annual costs calculated.

### **2.1.a Verify Project Costs**

The first step of an economic analysis of a publicly financed project is an evaluation of the proposed project. Public entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities that should be considered are:

- Public Education;
- Change in Raw Materials;
- Substitution of Process Chemicals;
- Change in Process;
- Water Recycling and Reuse; and
- Pretreatment Requirements.

Many of these approaches are particularly relevant to industrial indirect discharges to the public system. Whatever the approach, the applicant must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives

that meets water quality standards will not have a substantial financial impact, then the community should not proceed with the analysis presented in the rest of this workbook. General information regarding the proposed pollution control project and other projects considered should be supplied in **Worksheet A**.

The most cost-effective approach to meeting water quality standards should be considered. Submissions should include assumptions about excess capacity, population growth, and consideration of alternative technologies where appropriate. The most accurate estimate of project costs may be available from the discharger's design engineers. If site-specific engineering cost estimates are not available, preliminary project cost estimates can be derived from a comparable project in the State or from the judgement of experienced water pollution control engineers. (See Appendix A for sources of engineering cost information.) Capital, operation and maintenance (O&M), and other project costs can be summarized using **Worksheet B**. For comparative purposes, cost estimates (e.g. capital, O&M, other project costs) for each alternative being considered should be presented in the same units (typically annualized costs, \$/yr) and for the same year. The next section explains how to annualize project costs.

For illustrative purposes, the example of a local government upgrading their existing wastewater treatment facility in order to meet water quality standards is used throughout this chapter. Details of this example may differ significantly from other projects undertaken to meet water quality objectives. Other types of public-sector water pollution control, however, would be analyzed in a similar fashion using the worksheets included in this chapter.

### **2.1.b Calculate the Annual Costs of the Pollution Control Project**

Since capital costs typically will be paid over several years, annualized costs are used in the evaluation of economic burden to the community. The capital portion of

**Worksheet A**

**Pollution Control Project Summary Information**

Current Capacity of the Pollution Control System	_____
Design Capacity of the Pollution Control System	_____
Current Excess Capacity	_____ %
Expected Excess Capacity after Completion of Project	_____ %
Projected Groundbreaking Date	_____
Projected Date of Completion	_____

Please describe the pollution control project being proposed below. (Attach additional page if necessary).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please describe the other pollution control options considered, explaining why each option was rejected. (Attach additional page if necessary).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Worksheet B

### Calculation of Total Annualized Project Costs

**A. Capital Costs**

Capital Cost of Project \$ \_\_\_\_\_

Other One-Time Costs of Project (Please List, if any):

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

**Total Capital Costs (Sum column)** \$ (1)

Portion of Capital Costs to be Paid for with Grant Monies \$ (2)

Capital Costs to be Financed [Calculate: (1) - (2) ] \$ (3)

Type of financing (e.g., G.O. bond, revenue bond, bank loan) \_\_\_\_\_

Interest Rate for Financing (expressed as decimal) (i)

Time Period of Financing (in years) (n)

Annualization Factor =  $\frac{i}{(1+i)^n - 1} + i$  (or see Appendix B) (4)

**Annualized Capital Cost [Calculate: (3) x (4) ]** (5)

**B. Operating and Maintenance Costs**

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

**Total Annual O & M Costs (Sum column)** \$ (6)

**C. Total Annual Cost of Pollution Control Project**

Total Annual Cost of Pollution Control Project [ (5) + (6) ] \$ (7)

project costs is typically financed over approximately 20 years, by issuing a municipal debt instrument such as a general obligation bond or a revenue bond. Local governments may also finance capital costs using bank loans, state infrastructure loans (revolving funds), or federally subsidized loans (such as those offered by the Farmers' Home Administration).

It should be noted that interest rates used to annualize costs are dependent on the type of debt instrument used as well as the recipient's credit standing. For example, revenue bonds typically are financed at a slightly higher interest rate because of their dependence on revenues from services as opposed to being guaranteed by the full faith and credit of the jurisdiction. Because interest rates affect the interest payment and thus the annualized capital cost of the project, it is important that the interest rate used on **Worksheet B** reflects the debt instrument (i.e. municipal bond, commercial bank loan, state revolving fund loan, or other instrument) likely to be used by the municipality.

The calculation of total annualized cost of the project is presented in **Worksheet B**. First, capital costs are summed and the portion of costs to be paid for with grant monies are deducted, as these costs will not need to be financed. Next, the annualization factor is calculated using the formula supplied on **Worksheet B**, or the annualization factor is found in Appendix B. Annualized capital cost is then calculated by multiplying the total capital costs to be financed by the annualization factor.

Next, annual operating and maintenance costs are summed, and the total is added to the annualized capital cost. These costs should include the costs of monitoring, inspection, permitting fees, waste disposal charges, repair, administration, replacement, and any other recurring costs. All recurring costs should be stated in terms of dollars per year. The sum of the annualized capital cost and total annual operating and maintenance costs is the total annual cost of the project. In the next section, the annualized costs paid by households in the community are calculated.

## **2.2 Calculate Total Annualized Pollution Control Costs Per Household**

In order to assess the burden that total pollution control costs are expected to have on households, an average annualized pollution control cost per household should be calculated for all households in the community that would bear project costs. In order to evaluate substantial impacts, therefore, the analysis must establish which households will actually pay for pollution control as well as what proportion of the costs will be borne by households. These apportioned project costs are then added to existing pollution control costs paid by households.

It is important to first define the affected community. The "community" is the governmental jurisdiction responsible for paying compliance costs. In practice, pollution control projects may serve several communities or just portions of a community. In the case of a sewage agency serving several communities, once project costs are allocated to each community served, the economic analysis is conducted on a community by community basis. In the case of a community in which only a portion of the community is served, the affected community is defined as those who will pay the compliance costs. In such cases, it may be difficult to obtain socioeconomic data for just part of the community and data for the entire community may be used instead. The area that is affected may not be the same as the area that is paying, therefore it may be appropriate to evaluate widespread impacts, described in Chapter 4, over a community that is defined differently than the paying community.

If project costs were estimated for some prior year, these costs should be adjusted upward to reflect current year prices using the average annual national Consumer Price Index (CPI) inflation rate for the period. The CPI inflation rate is available from the Bureau of Labor Statistics. An additional source reporting the CPI inflation rate is the *CPI Detailed Report*, which is published monthly by the U.S. Department of Labor, Bureau of Labor Statistics.

The ratio of the current CPI to the CPI for the year of the cost estimates indicates how much costs have increased over the period. This ratio can be applied to the cost estimates to "bring them up to current year costs." Likewise, there are engineering cost indices that can be used for this purpose.

If project costs are not distributed simply according to wastewater flow or tax revenues, then consideration should be given to separately analyzing the impacts on users who pay a disproportionate share of the costs. This situation can arise, for example, where industrial dischargers to a sewer system are assessed pollutant surcharges to pay for their share of the cost of advanced treatment necessitated by the presence of their pollutants. Remaining costs would then be split among households according to wastewater flow or tax revenues, whichever is appropriate. The total amount of the pollution control project to be recouped by surcharges should, therefore, be removed from the total project cost before costs are allocated according to wastewater flow or tax revenues.

In calculating the total annual cost of pollution control per household, current costs of pollution control must be considered along with the projected annual costs of the proposed pollution control project. The existing cost per household usually can be obtained from the most recent municipal records. For example, it can be found in the sewer enterprise fund accounts for communities that maintain a separate enterprise fund. It is not necessary, in such cases, to sum all the cost components. Instead, use the most recent operating revenues, divided by the number of households served. In cases where the community does not maintain a separate enterprise fund for sewers, the cost elements can be summed from the consolidated statement for the community. If the portion of proposed project costs that households are expected to pay is known or is expected to remain unchanged, then use **Worksheet C** to calculate the total annual cost of pollution control per household. If the portion paid by households is based on flow, then should refer to **Worksheet C: Option A** as well.

## Worksheet C

### Calculation of Total Annual Pollution Control Costs Per Household

#### A. Current Pollution Control Costs:

Total Annual Cost of Existing Pollution Control	\$	(1)
Amount of Existing Costs Paid By Households	\$	(2)
Percent of Existing Costs Paid By Households		%(3)
Number of Households*		(4)
Annual Cost Per Household [Calculate: (2)/(4) ]	\$	(5)

\* Do not use number of hook-ups.

#### B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

- a) Yes [fill in percent from (3) ]  percent.(6a)
- b) No, they are expected to pay  percent.(6b)
- c) No, they are expected to pay based on flow. (Continue on Worksheet C, Option A)

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B]	\$	(7)
Proportion of Costs Households Are Expected to Pay [ (6a) or (6b) ]		(8)
Amount to Be Paid By Households [Calculate: (7) x (8) ]	\$	(9)
Annual Cost per Household [Calculate: (9)/(4) ]	\$	(10)

#### C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10) \$ (11)

## Worksheet C: Option A

### Calculation of Total Annual Pollution Control Costs Per Household Based on Flow

#### A. Calculating Project Costs Incurred By Households Based on Flow

Expected Total Usage of Project (eg. MGD for Wastewater Treatment)	_____	(1)
Usage due to Household Use (MGD of Household Wastewater)	_____	(2)
Percent of Usage due to Household Use [Calculate: (2)/(1) ]	_____	%(3)
Total Annual Cost of Pollution Control Project	\$ _____	(4)
Industrial Surcharges, if any	\$ _____	(5)
Costs to be Allocated [Calculate: (4) - (5) ]	\$ _____	(6)
Amount to Be Paid By Households [Calculate: (3) x (6) ]	\$ _____	(7)
Annual Project Cost per Household [Calculate: (7)/Worksheet C, (4) ]	\$ _____	(8)

#### C. Total Annual Pollution Control Cost Per Household

Annual Existing Costs Per Household [Worksheet C, (5) ]	\$ _____	(9)		
Total Annual Cost of Pollution Control Per Household [ (8) + (9) ]	<table border="1"><tr><td>\$ _____</td><td>(10)</td></tr></table>	\$ _____	(10)	
\$ _____	(10)			

The cost per household as a percent of median household income is used in Section 2.3 as a screener to quickly identify those communities that clearly will not face substantial impacts due to pollution control. For guidance in estimating impacts on non-household users (e.g., industrial, commercial), refer to Chapter 3.

### **2.3 Calculate and Evaluate The Municipal Preliminary Screener Value**

Whether or not the community is expected to incur "substantial" economic impacts due to the pollution control project is determined by jointly considering the results of two tests. The first test is a "screener" to establish whether the community can clearly pay for the project without incurring any substantial impacts. The Municipal Preliminary Screener estimates the total annual pollution control costs per household (existing costs plus those attributable to the proposed project) as a percentage of median household income. The screener is written as follows:

$$\text{Municipal Preliminary Screener} = \frac{\text{Average Total Pollution Control Cost per Household}}{\text{Median Household Income}}$$

Median household income information for many municipalities is available from the 1990 Census of Population. If median household income is not available for the current year, it should be estimated for the current year by using the CPI inflation rate for the period between the year that median household income is available and the current year. To calculate the inflation rate over the relevant period, use the "percent change from the previous annual average" (annual inflation rate) presented in the *CPI Detailed Report*. For example, if the current year is 1993, 1990 is the most recent year that median household income is available, and the percentage changes for the 1990, 1991, and 1992 annual averages respectively are: 5.2, 4.1 and 2.9, the adjustment factor equals:

$$\text{Adjustment Factor} = 1.052 * 1.041 * 1.029 = 1.13$$

$$\text{Adjusted Median Household Income} = \\ \text{Median Household Income} * \text{Adjustment Factor}$$

Depending on the results of the screener, the community is expected to incur little, mid-range, or large economic impacts due to the proposed project (see **Worksheet D**). If the total annual cost per household (existing annual cost per household plus the incremental cost related to the proposed project) is less than 1.0 percent of median household income, it is assumed that the project is not expected to impose a substantial economic hardship on households. The screener is therefore set at 1.0 percent of median household income. Communities with screener results of less than 1.0 but still fairly close to 1.0, however, may still want to proceed to the Secondary Test.

Communities are expected to incur mid-range impacts when the ratio of total annual compliance costs to median household income is between 1.0 and 2.0 percent. If the average annual cost per household exceeds 2.0 percent of median household income, then the project may place an unreasonable financial burden on many of the households within the community. In either case, communities move on to the Secondary affordability Test to demonstrate substantial impacts. For example, assume that Community XYZ has a screener of 2.3 percent. Although it appears that the community faces large impacts, substantial impacts have not necessarily been demonstrated and the community must proceed to the next step and apply the Secondary Test. Dischargers with screener values well below 1.0 percent are assumed to be able to pay for pollution control without incurring any substantial economic impacts and are required to meet existing water quality standards. They do not need to proceed to the Secondary Test (see Figure 2-1).

#### **2.4. Apply Secondary Test**

The Secondary Test is designed to build upon the characterization of the financial burden identified in the

## Worksheet D

### Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income}^*} \times 100$$

#### A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or Worksheet C, Option A (10) ]	\$	(1)
<hr/>		
Median Household Income*	\$	(2)
<hr/>		
<b>Municipal Preliminary Screener</b> (Calculate: [(1)/(2)] x 100)		%(3)

#### B. Evaluation of The Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

<b>Little Impact</b> Less than 1.0%	<b>Mid-Range Impact</b> 1.0% - 2.0%	<b>Large Impact</b> Greater than 2.0%
Indication of no substantial economic impacts	_____→ <b>Proceed to Secondary Test</b>	

\* 1990 Census adjusted by CPI inflation rate if necessary.

**Municipal Preliminary Screener.** The Secondary Test indicates the community's ability to obtain financing and describes the socioeconomic health of the community. Indicators describe precompliance debt, socioeconomic, and financial management conditions in the community. Using these indicators and the scoring system described below, the impact of the cost of pollution control is estimated. Specifically, applicants are required to present the following six indicators for the community:

#### Debt Indicators

- **Bond Rating (if available)** - a measure of credit worthiness of the community;
- **Overall Net Debt as a Percent of Full Market Value of Taxable Property** - a measure of debt burden on residents within the community;

#### Socioeconomic Indicators

- **Unemployment Rate** - a measure of the general economic health of the community;
- **Median Household Income** - a measure of the wealth of the community;

#### Financial Management Indicators

- **Property Tax Revenue as a Percent of Full Market Value of Taxable Property** - a measure of the funding capacity available to support debt based on the wealth of the community; and
- **Property Tax Collection Rate** - a measure of how well the local government is administered.

A more detailed description of the six indicators, as well as alternative indicators for states with property tax limitations, are presented below. Table 2-1 summarizes the indicators and what is considered to be a strong, mid-range, or weak rating.

## **Debt Indicators**

### **Bond Rating**

Current ratings for the community summarize a bond rating agency's assessment of a community's credit capacity. The ratings generally reflect current financial conditions. If security enhancements like bond insurance have been used for the bond issue, however, the bond rating on a particular issue may be higher than local conditions justify. Only ratings for uninsured bonds, therefore, should be used.

Many small and medium sized communities have not used debt financing for projects and, as a result, have no bond rating. The absence of a bond rating does not indicate strong or weak financial health. When a bond rating is not available, this indicator should not be included in the analysis of substantial impacts. When available, the rating for the most recent general obligation bond should be used. If a general obligation bond has not been issued recently, the most recent rating for a sewer bond should be used. Recent bond ratings are included in municipal bond reports from rating agencies (e.g., *Moody's Bond Record*, *Standard and Poor's Corporation*).

### **Overall Net Debt as a Percent of Full Market Value of Taxable Property**

Overall Net Debt is debt repaid by property taxes. It excludes debt that is repaid by special user fees (e.g. revenue debt). This indicator provides a measure of debt burden on residents within the community and measures the ability of local government jurisdictions to issue additional debt. It includes the debt issued directly by the local jurisdiction and debt of overlapping entities, such as school districts. It compares the level of debt owed by the community with the full market value of real property used to support that debt and serves as a measure of the community's wealth.

Debt information is available from the financial statement of each community. In most cases, recent financial statements are on file with the State (e.g., State Auditor's Office). Overlapping debt may or may not be provided in a community's financial statements. The property assessment data (assessment ratio) should be readily available through the community or the State Assessor's Office. The boundary of the affected community generally conforms to one or more community boundaries. Therefore, prorating community data to reflect specific service area boundaries is not normally necessary for evaluating the general financial capability of the affected community.

### **Socioeconomic Indicators**

#### **Unemployment Rate**

The unemployment rate is defined as the percent of a community's labor force currently unemployed. If the unemployment rate in the service area is not available, the encompassing county's rate may be used as a substitute. The Bureau of Labor Statistics (BLS) maintains current unemployment rate figures for municipalities and counties. National unemployment data is also needed for comparison purposes. This information can be obtained from the BLS are available by request at (202) 606-6392. A community's unemployment rate is considered to be below the national average if it is more than 1% below the national average. Similarly, a community's unemployment rate is considered to be above the national average if it is more than 1% above the national unemployment rate. If the community's employment rate is equal to the national average unemployment rate, plus or minus 1%, then the community's unemployment rate is assessed as being equal to the national rate.

#### **Median Household Income**

Median household income (MHI) is defined as the median of the total income dollars received per household during a calendar year in a given area. It serves as an

overall indicator of community spending capacity. Median household income, which was also used in the screener process, is available from the 1990 Census or through state data centers. The state value is also needed for comparison purposes. If a community's median household income is more than 10% below the state's median household income, then it is considered to be below the state's median. If a community's median household income is more than 10% above the state's median, then it is considered to be above the state median value. If, however, the community's median household income is equal to the state median, plus or minus 10%, then the community's median household income is assessed as being equal to the state's median household income.

### **Financial Management Indicators**

#### **Property Tax Revenues as a Percent of Full Market Value of Taxable Property**

This indicator can be referred to as the "property tax burden" since it indicates the funding capacity to support new expenditures, based on the wealth of the community. Some states and local jurisdictions may have established legal limits on the amount of property taxes that can be levied as a percent of full market or assessed value of real property. Property assessment data should be readily available through the community or the State Assessor's Office. Property tax revenues are available in communities' annual financial statements.

#### **Property Tax Revenue Collection Rate**

This rate is an indicator of the efficiency of the tax collection system and a measure of how well the local government is administered. It compares the actual amount collected from property taxes to the amount levied. Property taxes levied can be computed by multiplying the assessed value of real property by the property tax rate, both of which are available from a community's financial statements or the State Assessor's Office.

### **Alternative Indicators for States with Property Tax Limitations**

Two of the indicators may not be appropriate in states with statutory limits on property tax collections and/or rates, or where data on full-market value of taxable property are not available.

The first of these indicators -- The Overall Net Debt as Percent of Full Market Value of Taxable Property -- can be replaced with:

#### **Overall Net Debt Per Capita**

In calculating the Secondary Score, the following ratings for Overall Net Debt Per Capita should be used:

Greater than \$3,000	= weak	= 1
\$1,000 - \$3,000	= mid-range	= 2
Less than \$1,000	= strong	= 3

The second of these indicators -- Property Tax Revenues as a Percent of Full-Market Value of Taxable Property -- has no appropriate substitute in cases where property taxes are at their limit or where full-market value of taxable property cannot be estimated. In such cases, this indicator should be dropped and the other five factors are assigned equal weights.

These six indicators are then used to form a composite assessment of the community's economic health and the financial impact of the required project. **Worksheet E** can be used to record each indicator. For each of the six indicators, the community is rated as weak, mid-range, or strong, based on the thresholds presented in Table 2-1.

## Worksheet E

### Data Used in the Secondary Test

Please list the following values used in determining the Secondary Score. Potential sources of the data are indicated.

#### A. Data Collection

Data	Potential Source	Value
Direct Net Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (1)
Overlapping Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (2)
Market Value of Property	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (3)
Bond Rating	Standard and Poors or Moody's	_____ (4)
Community Unemployment Rate	1990 Census of Population Regional Data Centers	_____ % (5)
National Unemployment Rate	Bureau of Labor Statistics (202) 606-6392	_____ % (6)
Community Median Household Income	1990 Census of Population	\$ _____ (7)
State Median Household Income	1990 Census of Population	\$ _____ (8)
Property Tax Collection Rate	Community Financial Statements Town, County or State Assessor's Office	_____ % (9)
Property Tax Revenues	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (10)

## Worksheet E, Continued

### B. Calculation of Indicators

#### 1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) + (2) ) \$ \_\_\_\_\_ (11)

Overall Net Debt as a Percent of Full Market Value of Taxable Property (Calculate: [(11)/(3)] x 100) % (12)

#### 2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a Percent of Full Market Value of Taxable Property (Calculate: [(10)/(3)] x 100) % (13)

For example, if a community's median household income equals \$15,000 and the state's median household income equals \$17,000, the community would be considered weak on this measure. If, however, the community's median household income were \$19,000, then the community would be considered strong on this measure.

Next, a Secondary Score is calculated for the community by weighting each indicator equally and assigning a value of 1 to each indicator judged to be weak, a 2 to each indicator judged to be mid-range, and a 3 to each strong indicator. A cumulative assessment score is arrived at by summing the individual scores and dividing by the number of factors used. **Worksheet F**, provided at the end of Section 2.4, guides the applicant through this calculation. The cumulative assessment score is evaluated as follows:

- less than 1.5 is considered weak
- between 1.5 and 2.5 is considered mid-range
- greater than 2.5 is considered strong

For example, consider a Community XYZ, which has:

- a weak ratio of overall net debt to full market value of taxable property = 1,
- a weak bond rating = 1,
- a mid-range unemployment rate = 2,
- a mid-range median household income = 2,
- a strong property tax collection rate = 3, and
- a strong ratio of property tax revenues to full market value of taxable property = 3.

$$[(1 + 1 + 2 + 2 + 3 + 3)/6] = 2$$

The Secondary Score for Community XYZ, equal to 2, falls into the mid-range category.

If the applicant is not able to develop one or more of the six indicators, they must provide an explanation as to why the indicator is not appropriate or not available. Since the point of the analysis is to measure the overall burden to the



Worksheet F

Calculating The Secondary Score

Please check the appropriate box in each row, and record the corresponding score in the final column. Then, sum the scores and compute the average. Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators.

Indicator	Secondary Indicators			Score
	Weak*	Mid-Range**	Strong***	
Bond Rating Worksheet E, (4)	Below BBB (S&P) Below Baa (Moody's) <input type="checkbox"/>	BBB (S&P) Baa (Moody's) <input type="checkbox"/>	Above BBB (S&P) or Baa (Moody's) <input type="checkbox"/>	
Overall Net Debt as Percent of Full Market Value of Taxable Property Worksheet E, (12)	Above 5% <input type="checkbox"/>	2%-5% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Unemployment Worksheet E, (5)& (6)	Above National Average <input type="checkbox"/>	National Average <input type="checkbox"/>	Below National Average <input type="checkbox"/>	
Median Household Income Worksheet E, (7) & (8)	Below State Median <input type="checkbox"/>	State Median <input type="checkbox"/>	Above State Median <input type="checkbox"/>	
Property Tax Revenues as a Percent of Full Market Value of Taxable Property Worksheet E, (13)	Above 4% <input type="checkbox"/>	2%-4% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Property Tax Collection Rate Worksheet E, (9)	< 94% <input type="checkbox"/>	94% - 98% <input type="checkbox"/>	> 98% <input type="checkbox"/>	

\* Weak is a score of 1 point

SUM

\*\* Mid-Range is a score of 2 points

\*\*\* Strong is a score of 3 points

AVERAGE

community, the debt and socioeconomic indicators are assumed to be better measures of burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the State/discharger should average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

*Economic Guidance for Water Quality Standards*

**Table 2-1**

**Secondary Indicators**

Indicator	Secondary Indicators		
	Weak	Mid-Range	Strong
Bond Rating	Below BBB (S&P) Below Baa (Moody's)	BBB (S&P) Baa (Moody's)	Above BBB (S&P) or Baa (Moody's)
Overall Net Debt as Percent of Full Market Value of Taxable Property	Above 5%	2%-5%	Below 2%
Unemployment	More than 1% above National Average	National Average	More than 1% below National Average
Median Household Income	More than 10% below State Median	State Median	More than 10% above State Median
Property Tax Revenues as a Percent of Full Market Value of Taxable Property	Above 4%	2%-4%	Below 2%
Property Tax Collection Rate	< 94%	94% - 98%	> 98%

## **2.5 Assess Where the Community Falls in The Substantial Impacts Matrix**

The results of the two tests are considered jointly in determining whether the community is expected to incur substantial impacts due to the proposed pollution control project.

In the following matrix, the cumulative assessment score for the community is combined with the estimated household burden. The combination of factors establishes whether impacts can be expected to be substantial. In the example of Community XYZ, their screener equaled 2.3 percent and their cumulative assessment score equaled 2. They are, therefore, in the middle cell in the far right column and thus have a rating of "X" in the matrix presented below (Table 2-2).

In the matrix, "X" indicates that the impact is likely to be substantial. The closer the community is to the upper right hand corner of the matrix, the greater the impact. Similarly, "✓" indicates that the impact is not likely to be substantial. The closer to the lower left hand corner of the matrix, the smaller the impact. Finally, the "?" indicates that the impact is unclear.

**Table 2-2  
Assessment of Substantial Impacts Matrix**

Secondary Score	Municipal Preliminary Screener		
	Less than 1.0 Percent	Between 1.0 and 2.0 Percent	Greater than 2.0 Percent
Less than 1.5	?	X	X
Between 1.5 and 2.5	✓	?	X
Greater than 2.5	✓	✓	?

For communities that fall into the "?" category, if the results of both the Secondary Test and the Municipal Preliminary Screener are borderline, then the community should move into the category closest to it. Take, for example, a community that falls into the center box, with a cumulative assessment score of between 1.5 and 2.5 and a percent of median household income (MHI) between 1.0 and 2.0. If the cumulative score was 1.6 and the percent of MHI was 1.8, then the community should be considered to fall into one of the adjacent "X" categories. If results are not borderline, other factors such as the impact on low or fixed income households, the presence of a failing local industry, and other projects the community would have to forgo in order to comply with water quality standards should be considered. Relevant additional information might include information collected from interviews with municipal financial officers, special reports on industry trends that may affect local employers, and specific financial and economic indicators. The State/discharger should provide any additional information they feel is relevant. This additional information will be critical where the matrix results are not conclusive.

EPA will interpret a "✓" rating to mean that the community is not expected to incur substantial impacts as

a result of the pollution control project. Communities falling into this category not be able to justify water quality standards providing for less protection than the fishable/swimmable goals of the Act, and will not be able to justify degradation of high quality waters. If the applicant State/discharger disagrees with the results of the Secondary Test, they may present additional information to the Regional EPA Administrator documenting the unique circumstances of the community. Since the impacts are not substantial, there is no need to demonstrate widespread impacts. EPA will interpret a "X" rating to mean that the community will incur substantial impacts. Before a water quality standard is modified or changed or a high quality water (other than an ONRW) degraded, however, communities falling into this category must demonstrate that impacts are also widespread. For those communities rated "?", EPA's interpretation will rely on the additional information presented by the State/discharger. It should be noted that, in this case, there is no "correct" set of information. It will be up to the applicant to collect whatever information they feel is relevant in describing the unique circumstances affecting their community. For example, the matrix may suggest that the community's financial condition is strong. At the same time, however, a local industry may be failing. In such a case, it is important to determine the importance of that industry to the local economy (as measured by its contribution to area employment, payroll, and tax revenues) and whether the industry itself would be affected by the project. Communities falling into either the "X" or the "?" category should proceed to Chapter 4 to determine whether the impacts are also expected to be widespread.

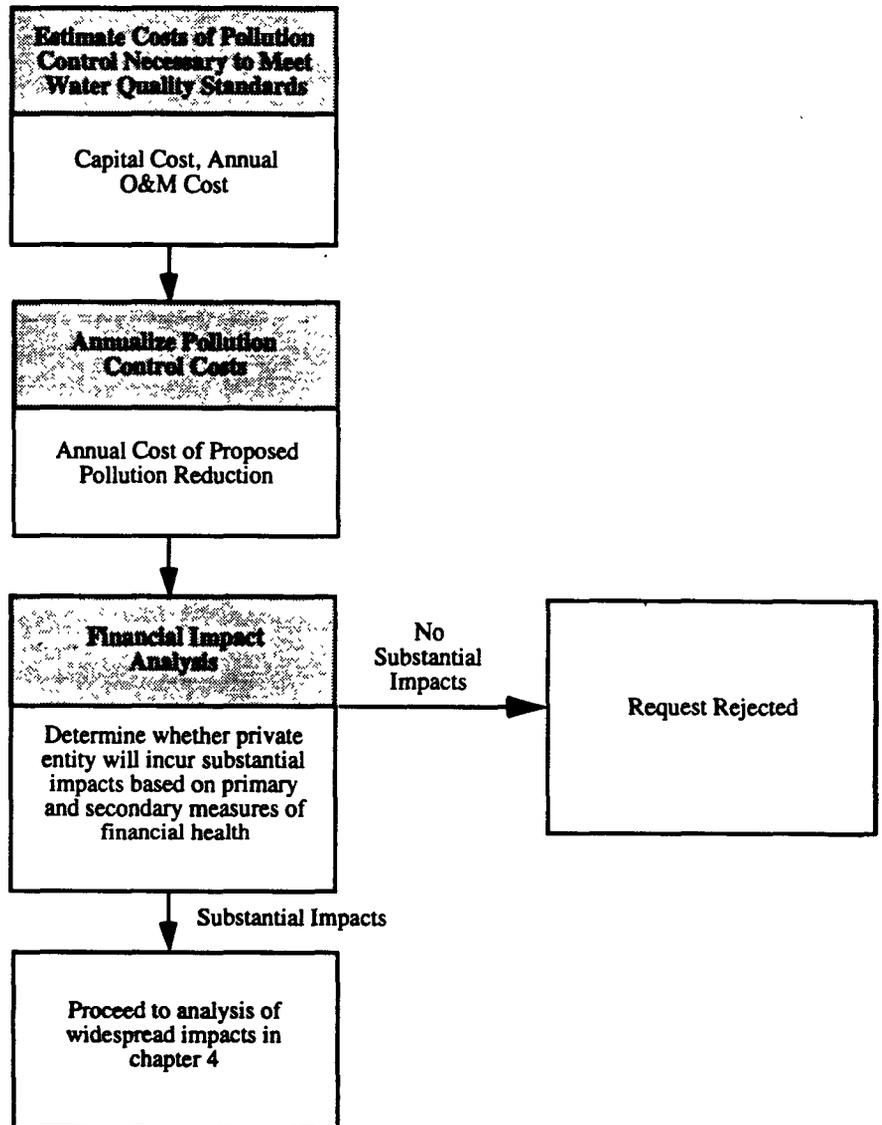
### **3. EVALUATING SUBSTANTIAL IMPACTS: PRIVATE-SECTOR ENTITIES**

For facilities owned by the private sector, measuring substantial impacts requires estimating the financial impacts on the entities that will pay for the pollution controls. For example, compliance with water quality standards may require that a particular facility, perhaps a factory, install additional wastewater treatment. After estimating the cost of the additional wastewater treatment, the next step is to measure the ability of the factory to pay for the additional treatment. If the analysis shows that the entity will not incur any substantial impacts due to the cost of pollution control (e.g., there will be no significant changes in the factory's level of operations nor profit), then the analysis is completed. If, on the other hand, the analysis shows that there will be substantial impacts on the entity, then the resulting impacts on the surrounding community must be considered (e.g. the impact of lost employment on the community's employment base, or the impact on the overall economy of the community). Impacts to the surrounding community, referred to as widespread impacts, are addressed in Chapter 4.

The following sections describe the steps involved in evaluating whether impacts will be substantial. These steps are outlined in Figure 3-1. This chapter explains how to adapt each of the steps to a range of data sources and provides worksheets to assist the discharger in working through each step. The analytic approach presented here can be used for a variety of private-sector entities, including commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution. The guidance provided in this chapter, however, is not meant to be exhaustive. The State and/or EPA may require additional information or tests in order to evaluate whether substantial and widespread impacts will occur. In addition, the applicant should feel free to include any additional information they feel is relevant. The steps described in further detail in the rest of the chapter are:

*Economic Guidance for Water Quality Standards*

**Figure 3-1:  
Measuring Substantial Impacts  
(Private Entities)**



- **Verify Project Costs and Calculate the Annual Cost of the Pollution Control Project** - This section discusses factors that should be considered when verifying that the proposed pollution control project is the most appropriate solution to the pollution problem. It also describes the type of general information that should be provided about the proposed project. In addition, it discusses how to annualize capital costs of the project and calculate total annual costs of the pollution control project.
- **Financial Impact Analysis** - This section describes the types of financial tests that should be applied to measure the impact on the applicant. The primary measure is profitability. The secondary measures include indicators of liquidity, solvency, and leverage.

Most of this chapter is written in terms of evaluating whether there will be a substantial impact on a particular discharger. This type of analysis is necessary whenever there is a request for a variance. These same tests, however, can be used to analyze the impact on a group of dischargers, as might be the case in a use attainability analysis. For example, there may be several facilities that would confront similar requirements to improve their waste water discharges in order to meet a higher water quality standard under consideration. The same primary and secondary tests would be used to measure substantial impacts in the dischargers. The difference would be, however, when the analysis moved to measuring widespread impacts. Here the impacts on the total group of dischargers (or all dischargers in the relevant reach) would be used to measure whether or not the impacts are considered widespread.

### **3.1 Verify Project Costs and Calculate The Annual Cost of the Pollution Control Project**

Before the impact analysis can be performed, the project costs should be verified and the annual costs calculated.

#### **3.1.a Verify Project Costs**

The first step in the financial impact analysis is an evaluation of the proposed pollution control project. Private entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment. Specific types of pollution prevention activities to be considered include:

- Change in Raw Materials;
- Substitute Process Chemicals;
- Change in Process;
- Water Recycling and Reuse; and
- Pretreatment Requirements.

Whatever the approach, the discharger must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If at least one of the treatment alternatives that allows the applicant to meet water quality standards would not impose substantial impacts, then they are not able to demonstrate substantial impacts and should not proceed with the analysis presented in the remainder of this workbook.

Since the most cost-effective approach to meeting the fishable/swimmable goals of the Act and avoiding degradation of high quality waters should be considered, submissions should list their assumptions about excess capacity, future facility expansion, and alternative technologies. The most accurate estimate of project costs may be available from the discharger's design engineers. These estimates can be compared to estimates available from EPA.

### **3.1.b Calculate the Annual Costs of the Pollution Control Project**

In order to perform the economic tests, the cost of the pollution control needed to meet the fishable/swimmable goals of the Act and avoid degrading high quality waters must be calculated and converted to an annualized cost. Initially, pollution control costs are expressed in two parts: (1) the capital costs of purchasing and installing the equipment and (2) the yearly operating and maintenance (O&M) costs. Both the capital and O&M cost estimates should be provided by the discharger requesting relief. To assess whether the costs represent the most cost effective means of meeting the water quality standards, they should be compared to costs at comparable entities that meet the same standards. For dischargers covered by effluent guidelines, compliance costs have been calculated by the Agency and are available for comparative purposes. (See Appendix A.) Costs for nonpoint sources are less readily available.

Instead of assuming that the total capital costs will be paid in the first year of operation, these costs are usually annualized. By assuming that costs are spread out over several years, annualization calculates the amount that will be paid each year, including the financing costs. In order to allow for comparisons across cases, the analysis should assume that the applicant will borrow the capital for the pollution control equipment and repay the loan in even annual installments over a 10 year period. The assumption of ten years is based on the likely life of the equipment. The assumption of even annual installments is made for convenience. The interest rate on the loan should be equivalent to the rate the applicant pays when it borrows money. If it borrows from the parent firm, the interest charge should be equivalent to the interest charged by the parent firm. If the parent firm would lend the entity money without interest, then the interest payments should be equivalent to the interest rate the applicant would pay to borrow from a bank or on its line of credit. If it is impossible to determine the appropriate interest rate, the analysis should assume an interest rate equal to the prime rate plus one percent.

The financial tests discussed below compare the costs of compliance to other costs and revenues of the applicant. Compliance costs and other costs and revenues must, therefore, be comparable. In other words, they should be calculated for the same year. If compliance costs are estimated assuming construction several years in the future, they should be deflated back to the year of the financial data. This can be done by assuming that the inflation rate over the last five years will continue into the future. See discussion in Section 2.2, and Appendix A for references to inflation/deflation indices. Likewise, if costs were estimated for an earlier year, they should be inflated to current year costs. The Annualized Cost of Pollution Control can be calculated using **Worksheet G**.

### **3.2 Financial Impact Analysis**

The purpose of the financial impact analysis is to assess the extent to which existing or planned activities and/or employment will be reduced as a result of meeting the water quality standards. The tests described in this Workbook are not designed to determine the exact impact of pollution control costs on an entity. They merely provide indicators of whether pollution control costs would result in a substantial impact.

Four general categories of financial tests are presented in the following sections. As indicated below, the four categories are divided into a primary measure of financial impacts and three secondary measures of financial impacts:

#### **Primary Measure**

- Profit -- how much will profits decline due to pollution control expenditures?

#### **Secondary Measures**

- Liquidity -- how easily can an entity pay its short-term bills?
- Solvency -- how easily can an entity pay its fixed and long-term bills?

## Worksheet G

### Calculation of Total Annualized Project Costs

Capital Costs to be financed (Supplied by applicant)	\$	(1)
Interest Rate for Financing (Expressed as a decimal)		(i)
Time Period of Financing (Assume 10 years*)		10 years (n)
Annualization Factor** = $\frac{i}{(1+i)^{10} - 1} + i$		(2)
Annualized Capital Cost [Calculate: (1) x (2) ]	\$	(3)
Annual Cost of Operation and Maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)***	\$	(4)
<b>Total Annual Cost of Pollution Control Project [ (3) + (4) ]</b>	<b>\$</b>	<b>(5)</b>

\* While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

\*\* Or see Appendix B for calculated annualization factors

\*\*\* For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

- **Leverage** -- how much money can the entity borrow?

Profit and solvency ratios are calculated both with and without the additional compliance costs (taking into consideration the entity's ability, if any, to increase its prices to cover part or all of the costs). Comparing these ratios to each other and to industry benchmarks provides a measure of the impact on the entity.

For all of the tests, it is important to look beyond the individual test results and evaluate the total situation of the entity. While each test addresses a single aspect of financial health, the results of the four tests should be considered jointly to obtain an overall picture of the economic health of the applicant and the impact of the water quality standards requirement on the applicant's health. The results should be compared with the ratios for other entities in the same industry or activity. In addition, the ratios and tests should be calculated for several years of operations. This will allow long-term trends to be differentiated from short-term conditions.

The structure, size, and financial health of the parent firm should also be considered. An important factor, which may not be reflected in the preceding measures, is the value of an applicant's product or operations to its parent firm. For example, if a facility produces an important input used by other facilities owned by the firm, the firm may be likely to support the facility even if it appears to have only borderline profitability. The results of these tests and other relevant factors, can be used to make a judgement as to the likely actions of the applicant (e.g. shut down entirely, close one or more product/service lines, shift to other products/services, not proceed with an expansion, continue operations at current levels) faced with the pollution control investment.

Each type of test measures a different aspect of a discharger's financial health. The primary measure evaluates the extent to which an applicant's profit rate will change, and compares the profit level to typical profits in

that industry. The secondary measures provide additional information about specific impacts that the discharger would bear if required to meet water quality standards. In some cases, the tests might indicate that the discharger would remain profitable (Profit) after investing in pollution control, but would have trouble borrowing the needed capital (Leverage). This situation would indicate a need to work with the discharger in choosing the technology and schedule used to meet the regulations. In other cases the tests might show that the discharger has a short-term problem with meeting the financial obligation imposed by the standards, but could handle it in the long-run (Liquidity vs. Solvency). This is important information when considering whether or not to grant a variance so as to allow more time for compliance.

Since it is the discharger that will have to pay for the wastewater treatment, the financial tests presented in this Workbook use data about the discharger's operations. This data, however, may not be readily available for the discharger itself, and if available, the discharger may consider the information to be confidential. It is EPA policy, however, that applications based on economic considerations must be accompanied by data that demonstrate the impacts.

If the information is not available at the discharger level, it can be estimated from the balance sheets or income statements of the firm that owns or controls the discharger. Estimates can be made in a variety of ways. One commonly used approach is to compare the discharger's sales or revenues to the firm's sales or revenues and apply this ratio to other financial factors. For example, if the discharger is responsible for 20 percent of its firm's revenues, then it is assigned 20 percent of the firm's current assets and current liabilities. In some cases, particularly with manufacturing facilities, the discharger may not sell its production directly, but may ship it to another facility owned by the same firm. In this case, the discharger's share of sales should be calculated by determining the market value of the goods produced by the

discharger, using market prices for the year being analyzed.

The primary and secondary measures are described below, along with an example of specific tests to be used. While there are several ratios that could be used for each test, to simplify the presentation only one ratio per test is described in detail. All four primary and secondary measures, however, should be used in the analysis.

In most cases, interpreting the results requires comparisons with typical values for the industry. Among the sources that provide comparative information are: Robert Morris Associates' *Annual Statement Studies*, *Moody's Industrial Manual*, Dun and Bradstreet's *Dun's Industry Norms*, and Standard & Poor's *Industry Surveys*. The *Annual Statement Studies*, *Dun's Industry Norms*, and Standard & Poor's *Industry Surveys* provide composite statistics for firms grouped into various manufacturing and service industries. The *Moody's Industrial Manual* provides detailed financial information on individual firms that can be used for comparison purposes. Although benchmarks are available for most financial tests, EPA emphasizes that the discharger should consider these benchmarks as indicators of financial health and not as definitive measures.

### **3.2.a Primary Measure: Profitability**

The Profit Test measures what will happen to the discharger's earnings if additional pollution control is required. If the discharger is making a profit now but would lose money with the pollution control, then the possibility of a total shutdown or the closing of a production line must be considered. Greatly reduced, but still positive, profits are also of concern. Likewise in the case of a proposed facility or proposed expansion; if estimated profits would drop considerably with pollution control, then the development might not take place.

Two pieces of information are needed for the Profit Test. The first piece is the total annual cost of the required

pollution control from **Worksheet G**. The second piece is the earnings information from the entity's income statement (**Worksheet H**).

$$\text{Profit Test} = \frac{\text{Earnings Before Taxes}}{\text{Revenues}}$$

The Profit Test should be calculated with and without the cost of pollution control. In the former case, the annualized cost of pollution control (including O&M) is subtracted from the discharger's earnings before taxes (revenues minus costs excluding income taxes) for the most recently completed fiscal year. Profits before pollution control investments have been made should be examined to determine whether the discharger was already in trouble (either not profitable or profits far below industry norms) before pollution control investments were made. If the discharger is already not profitable, it may not claim that substantial impacts would occur due to compliance with water quality standards.

The Profit Test can be calculated using **Worksheets H, and I**. Earnings before taxes (EBT) should be calculated for at least the three previous fiscal years in order to identify any trends or atypical years. Earnings with pollution control costs should be calculated for the latest year with complete financial information. Arguably, as long as the applicant maintains positive earnings, it can afford to pay for the pollution control. Over the long run, however, the owner is likely to shift operations to more profitable facilities, if possible. The workbook, therefore, guides the applicant through a more thorough analysis, which compares the EBT, with and without pollution control, to total revenues to yield a profit rate and change in the profit rate due to pollution control. (Use **Worksheet I**.) These profit rates should be compared to those for facilities in similar lines of business. As with other tests, it may not be possible to compare the discharger's rate directly with the rates of similar facilities. In such cases the discharger's profit rate should be compared with that of firms that concentrate in similar businesses, using data in

## Worksheet H

### Calculation of Earnings Before Taxes With and Without Pollution Control Project Costs

#### A. Earnings Without Pollution Control Project Costs

$$\text{EBT} = \text{R} - \text{CGS} - \text{CO}$$

Where:

- EBT = Earnings Before Taxes
- R = Revenues
- CGS = Cost of Goods Sold (including the cost of materials, direct labor, indirect labor, rent and heat)
- CO = Portion of Corporate Overhead Assigned to the Discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)

#### Three Most Recently Completed Fiscal Years

	19____	19____	19____	
R	\$ _____	\$ _____	\$ _____	(1)
CGS	\$ _____	\$ _____	\$ _____	(2)
CO	\$ _____	\$ _____	\$ _____	(3)
EBT [ (1) - (2) - (3) ]	\$ _____	\$ _____	\$ _____	(4)

**Considerations:** Have earnings before taxes changed over the three year period? If so, what would a "typical" year's EBT be? Please explain below.

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**Worksheet H, Continued**

**B. Earnings With Pollution Control Project Costs**

**EWPR = EBT - ACPR**

Where: EWPR = Earnings with Pollution Control Project Costs  
EBT = Earnings Before Taxes (4)  
ACPR = Total Annual Costs of Pollution Control Project [Worksheet G, (5) ]

	19__*	
EBT (4)	\$ _____ (5)	
ACPR [Worksheet G, (5)]	\$ _____ (6)	
EWPR [ (5) - (6) ]	<table border="1"><tr><td>\$ _____ (7)</td></tr></table>	\$ _____ (7)
\$ _____ (7)		

\* The most recently completed fiscal year

**Considerations:** Is the discharger expected to have positive earnings after paying the annual cost of pollution control?  Yes  No

**Additional Comments:**

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## Worksheet I

### Calculation of Profit Rates With and Without Pollution Control Project Costs

#### A. Profit Rate Without Project Costs

$$\text{PRT} = \text{EBT} \div \text{R}$$

Where:      PRT =      Profit Rate Before Taxes  
               EBT =      Earnings Before Taxes  
               R =         Revenues

#### Three Most Recently Completed Fiscal Years

	19__	19__	19__	
EBT [Worksheet H, (4)]	_____	_____	_____	(1)
R [Worksheet H, (1)]	_____	_____	_____	(2)
PRT = Calculate: [(1)/(2)]				(3)

**Considerations:** How have profit rates changed over the three years?

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Is the most recent year typical of the three years?    Yes    No  
 (If not, you might want to use an earlier year or years for the analysis)

How do these profit rates compare with the profit rates for this line of business"? Please discuss below.

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## Worksheet I, Continued

### B. Profit Rate With Pollution Control Costs

$$\text{PRPR} = \text{EWPR} \div \text{R}$$

Where: PRPR = Profit Rate With Pollution Control Costs  
EWPR = Before-Tax Earnings With Pollution Control Costs  
R = Revenues

	The Most Recently Completed Fiscal Year	
	19__	
EWPR [Worksheet H, (7)]	\$ _____	(4)
R [Worksheet H, (1)]	\$ _____	(5)
PRPR [Calculate: (4)/(5)]	(6)	

Considerations:

What is the percentage change in the profit rate due to pollution control costs? Calculate as follows:  
 $(\text{PRPR} - \text{PR})/\text{PR} \times 100$

---

How does the profit rate with pollution control compare to the profit rate of this line of business?

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*Moody's Industrial Manual, Dun & Bradstreet's Industry Norms and Key Business Ratios, Standard & Poor's Industry Surveys, or Robert Morris's Annual Statement Studies.* If the discharger's ratio compares favorably with the median or upper quartile ratio for similar businesses, the discharger is considered to be financially healthy. A typical income statement, like those found in *Moody's Industrial Manual*, has been included in Exhibit 3-1. The appropriate data have been underlined.

Although complicated, the analysis should consider whether the discharger or firm would be able to raise its prices in order to cover some or all of the pollution control costs. In such a case, revenues increase and earnings fall by an amount less than the costs of pollution control. The degree to which the discharger is able to raise prices is difficult to predict, and depends on many factors. Considerations should include the level of competition in the industry, the likelihood of competitors' facilities facing similar project costs, and the willingness of consumers to pay more for the product.

### **3.2.b Secondary Measures**

The following secondary measures provide additional important information about the financial health of the discharger. All primary and secondary measures will be included in the analysis. It is not sufficient to conclude that the discharger will be unprofitable after pollution control investments. In addition, the applicant should feel free to include any additional information about the discharger's financial health that they feel is relevant.

#### **Liquidity**

Liquidity is a measure of how easily a discharger can pay its short-term bills. One measure of liquidity is the Current Ratio, which compares current assets with current liabilities. Current assets include cash and other assets that are or could reasonably be converted into cash during the current year. The following items are considered to be current assets:

Exhibit 3-1

XYZ, INC.  
**CONSOLIDATED  
 STATEMENTS OF  
 INCOME AND  
 RETAINED EARNINGS  
 (DEFICIT)**

FOR THE YEARS ENDED SEPTEMBER 30, 1988, 1987, 1986

	1988	1987	1986
Net sales	\$42,389,957	\$31,294,962	\$30,730,768
Cost of sales	35,981,363	26,405,930	24,972,185
Gross profit	6,408,594	6,889,032	5,758,583
Selling, general and administrative expenses	3,957,771	3,876,206	3,824,226
Income from operations	2,450,823	3,012,826	1,934,357
Other income (deductions)			
Interest income	441,891	347,613	362,295
Interest expense	(10,985)	(22,513)	(46,467)
Other investment income - net			134,690
Miscellaneous	55,066	48,660	93,654
Total other income (deductions) - net	485,972	373,760	544,172
Income before income taxes	2,936,795	3,386,586	2,478,529
Provision for income taxes	1,139,118	1,620,012	1,150,949
Net income	1,797,677	1,766,574	1,327,580
Retained earnings, beginning of year	1,157,528	1,726,292	1,983,007
Stock dividend	(2,610,888)	(1,952,645)	(1,365,590)
Cash dividend (\$ .11 per share, 1988; \$ .08 per share, 1987; \$ .06 per share, 1986)	(391,960)	(300,693)	(218,705)
Common stock acquired and retired	(2,591)	(82,000)	
Retained earnings (deficit), end of year	\$ (50,234)	\$ 1,157,528	\$ 1,726,292
Weighted average number of shares outstanding	3,593,048	3,630,652	3,637,798
Earnings per common share	\$ .50	\$ .49	\$ .36

See accompanying Notes to Financial Statements

**INDEPENDENT  
 AUDITORS'  
 REPORT**

To the Shareholders of XYZ, Inc.:

We have audited the consolidated balance sheets of XYZ, Inc. at September 30, 1988 and 1987, and the related consolidated statements of income and retained earnings (deficit), and cash flows for each of the three years in the period ended September 30, 1988. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the financial position of the companies at September 30, 1988 and 1987, and the results of their operations and their cash flows for each of the three years in the period ended September 30, 1988 in conformity with generally accepted accounting principles.

DELOITTE HASKINS & SELLS  
 Minneapolis, Minnesota  
 December 5, 1988

- **Inventories** -- finished products, products in the process of being manufactured, raw materials, supplies, fuels, etc.;
- **Prepaid expenses** -- expenses paid in advance of use such as prepaid rent;
- **Short-term investments** -- savings accounts, certificates of deposit;
- **Accounts receivable**;
- **Marketable securities**; and
- **Cash**.

Likewise, current liabilities are items that must be paid within the current year. The following items are considered to be current liabilities:

- **Accounts payable** -- purchases of goods for resale and services received in the normal course of business;
- **Wages payable**;
- **Short-term notes payable** -- any debt initially incurred and due in the current year;
- **Accrued expenses** -- expenses that have been incurred but have not yet been paid at the end of the accounting period;
- **Taxes**; and
- **Current portion of any long-term debt**.

A more stringent test is the Quick Ratio, also known as the Acid Test, which compares current assets without inventories to current liabilities. It does not include inventories since they may take time to convert to cash and

may be valued on the discharger's books for more than they could be sold.

The Current Ratio should be calculated for each of the last three full fiscal years for which there are data. Comparing ratios for three years will identify any trends that are developing and will ensure that the most recent year is not an unusual year that might distort the results of the analysis.

The Current Ratio is calculated by dividing current assets by current liabilities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The Current Ratio can be calculated using **Worksheet J**. The general rule is that if the Current Ratio is greater than 2, the entity should be able to cover its short-term obligations. Frequently, lenders require this level of liquidity as a prerequisite for lending. While a Current Ratio of greater than 2 indicates that the entity can probably cover its short-term obligations, the impact of a major capital investment such as the pollution control project must be judged in conjunction with the other three financial tests described in this guidance.

In addition, this rule (Current Ratio > 2) may not be appropriate for all types of private entities covered by Water Quality Standards. The Current Ratio of the discharger in question should be compared with ratios for other dischargers in the same line of business. It may not be possible, however, to compare the discharger's ratio directly with other similar dischargers because this information frequently is unavailable at the facility level or is considered confidential. In cases where a direct comparison cannot be made, the discharger's Current Ratio should be compared with the ratio for firms that concentrate in similar businesses. If the discharger's ratio compares favorably with the median or upper quartile ratio for similar businesses, it should be able to cover its short

## Worksheet J

### Calculation of The Current Ratio

$$CR = CA \div CL$$

Where: CR = Current Ratio  
CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)  
CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

#### Three Most Recently Completed Fiscal Years

	19__	19__	19__
CA	\$ _____	\$ _____	\$ _____ (1)
CL	\$ _____	\$ _____	\$ _____ (2)
CR [Calculate: (1)/(2)]	<input type="text"/>	<input type="text"/>	<input type="text"/> (3)

#### Considerations:

Is the most recent year typical of the three years?  Yes  No  
(If not, you might want to use an earlier year or years for the analysis)

Is the Current Ratio (3) greater than 2.0?  Yes  No

How does the Current Ratio (3) compare with the Current Ratios for other firms in this line of business?

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term obligations. Among the sources that provide comparison information are: Robert Morris Associates' *Annual Statement Studies*, *Moody's Industrial Manual*, and Dun and Bradstreet's *Dun's Industry Norms*. The *Annual Statement Studies* and *Dun's Industry Norms* provide composite statistics for firms grouped by different manufacturing and service industries. The *Moody's Industrial Manual* provides detailed financial information on individual firms. Pages from both of these sources are displayed in Exhibits 3-2 and 3-3, with the appropriate data indicated.

### Solvency

Solvency is a measure of an entity's ability to meet its fixed and long-term obligations. These obligations are bills and debts that are owed on a regular basis for periods longer than one year. Solvency tests are commonly used to predict financial problems that could lead to bankruptcy within the next few years. Since any single year of data can easily be distorted by unusually high or low net income or by the timing of debt, solvency tests must be considered over at least three years of data in order to reveal long-term trends.

As with liquidity, there are several possible tests for solvency. One commonly used solvency test (called Times Interest Earned) compares income before interest and taxes to interest expenses. Another solvency test, the Beaver's Ratio, compares cash flow to total debt. This test has been shown to be a good indicator of the likelihood of bankruptcy.

$$\text{Beaver's Ratio} = \frac{\text{Cash Flow}}{\text{Total Debt}}$$

The Beaver's Ratio can be calculated using **Worksheet K**. Cash Flow is a measure of the cash the entity has available to it in a given year. Since depreciation is an accounting cost -- a cost that does not use any currently

### Exhibit 3-2

#### MANUFACTURERS • GAMES, TOYS & CHILDREN'S VEHICLES; EXCEPT DOLLS & BICYCLES. SIC # 3844

Comparative Historical Data			# Postretirement Benefits Type of Statement	Current Data Sorted by Sales					
17	19	19		1	3	7	4	4	11
11	21	24	Unqualified						
2	7	14	Reviewed	3	5		10	2	1
17	1	18	Complied	2		2	3	1	2
4/1/80- 3/31/81	4/1/81- 3/31/82	4/1/82- 3/31/83	Tax Returns						
ALL 47	ALL 68	ALL 75	Other	2	5			1	8
			NUMBER OF STATEMENTS	0-1MM 6	1-3mm 13	3-5MM 9	5-10MM 17	10-25MM 8	26MM & OVER 22
%	%	%	<b>ASSETS</b>	%	%	%	%	%	%
7.1	8.9	7.2	Cash & Equivalents		7.4		13.3		5.8
27.0	30.9	31.8	Trade Receivables - (net)		24.5		32.0		36.0
31.9	30.4	35.3	Inventory		47.4		31.0		28.3
2.1	1.9	1.7	All Other Current		.6		2.2		2.7
68.1	72.1	78.1	Total Current		79.8		78.5		72.7
19.2	17.5	16.7	Fixed Assets (net)		16.1		14.4		17.2
4.2	3.7	3.1	Intangibles (net)		1.8		2.2		5.4
8.5	6.7	4.1	All Other Non-Current		2.3		4.9		4.7
100.0	100.0	100.0	Total		100.0		100.0		100.0
			<b>LIABILITIES</b>						
18.4	12.6	14.0	Notes Payable Short-Term		13.9		12.3		11.8
3.4	2.3	3.0	Cur. Mat.-L/T/D		4.5		3.6		.7
11.7	13.1	14.8	Trade Payables		14.5		12.0		16.5
.7	.8	.8	Income Taxes Payable		.5		.5		.7
8.1	9.0	11.1	All Other Current		5.8		10.8		11.9
40.3	38.0	43.2	Total Current		38.8		39.2		41.7
13.2	13.4	12.2	Long Term Debt		15.5		9.4		11.8
1.2	.5	.4	Deferred Taxes		.1		.5		.8
2.8	5.3	3.5	All Other Non-Current		2.2		2.1		1.7
42.4	42.9	40.6	Net Worth		43.4		48.8		44.3
100.0	100.0	100.0	Total Liabilities and Net Worth		100.0		100.0		100.0
			<b>INCOME DATA</b>						
100.0	100.0	100.0	Net Sales		100.0		100.0		100.0
35.5	37.2	38.0	Gross Profit		35.5		33.5		35.8
28.5	29.3	30.2	Operating Expenses		29.9		28.2		28.6
6.9	7.9	5.8	Operating Profit		5.7		5.3		7.2
3.3	1.8	1.2	All Other Expenses (net)		1.1		.4		1.8
3.7	6.1	4.9	Profits Before Taxes		4.6		4.9		5.3
			<b>RATIOS</b>						
2.5	2.8	2.9	Current		4.5		2.8		2.8
1.7	1.8	1.8			2.3		1.8		1.7
1.2	1.2	1.3			1.5		1.3		1.3
1.4	1.7	1.4	Quick		1.7		2.0		1.1
.8	1.1	.8			.8		.8		1.0
.6	.7	.6			.5		.6		.7
34	31	34	Sales Receivables	14	25.2	31	11.9	56	6.5
55	49	56		37	10.0	56	6.5	72	6.1
85	85	85		78	4.7	89	4.1	99	3.7
62	55	63	Cost of Sales/Inventory	79	4.8	43	8.5	68	5.4
104	85	94		126	2.9	78	4.7	85	4.3
146	152	146		166	2.2	140	2.6	118	3.1
21	21	18	Cost of Sales/Payables	10	38.1	12	30.2	29	12.5
29	27	30		27	13.3	22	18.4	39	9.4
50	47	61		40	9.1	33	11.0	66	5.5
3.9	3.4	3.3	Sales/Working Capital		2.8		3.0		3.3
7.6	6.2	6.3			4.4		6.5		5.1
17.5	10.8	13.8			14.0		11.5		15.0
(44)	(66)	(89)	EBIT/Interest	(12)	6.8	(14)	9.2		14.5
1.0	1.5	1.5			1.8		4.8	(21)	4.3
8.9	13.3	13.1	Net Profit + Depr., Dep., Amort./Cur. Mat./L/T/D		.8		1.3		2.9
(23)	(34)	(24)							
2.8	3.3	2.8							
.5	1.8	1.2							
.2	.2	.1	Fixed/Worth		.1		.1		.2
.6	.4	.6			.4		.3		.5
.8	.8	1.0			1.2		.7		1.0
.9	1.0	1.0	Debt/Worth		.7		.5		.7
2.0	1.8	1.8			1.5		1.1		1.7
3.0	3.3	3.3			3.0		5.5		2.6
(45)	(65)	(70)	% Profit Before Taxes/Tangible Net Worth		51.2	(16)	42.8	(21)	37.9
16.2	26.1	22.8			9.2		27.4		27.9
-1.1	7.0	4.6			-2.8		3.2		17.2
11.7	20.5	17.0	% Profit Before Taxes/Total Assets		21.1		18.6		14.2
5.5	10.8	7.8			3.3		9.6		8.2
-4	1.9	1.5			-.8		1.5		3.9
20.1	44.3	35.8	Sales/Net Fixed Assets		64.6		42.7		21.4
9.8	15.6	17.1			35.8		15.1		11.2
6.5	7.3	7.5			9.5		7.3		7.2
2.1	2.5	2.6	Sales/Total Assets		2.9		2.8		2.1
1.6	2.0	2.0			2.0		1.8		1.9
1.3	1.5	1.8			1.7		1.5		1.4
(36)	(81)	(61)	% Depr., Dep., Amort./Sales	(11)	.4		.8		1.4
2.1	1.7	1.6			.8		2.3		2.6
2.9	3.3	2.8			2.5		2.9		3.2
(12)	(23)	(30)	% Officers', Directors', Owners' Comp/Sales						
1.8	2.4	2.7							
4.3	4.1	4.5							
6.7	9.5	7.8							
1537661M	1883457M	1840680M	Net Sales (\$)	3293M	27202M	36782M	116678M	115773M	1540952M
1092333M	1169085M	1136958M	Total Assets (\$)	1948M	13736M	20946M	72757M	52973M	974589M

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M = \$thousand MM = \$million  
See Pages 1 through 15 for Explanation of Ratios and Data

### Exhibit 3-3

**XYZ, INC.**  
**CONSOLIDATED**  
**BALANCE**  
**SHEETS**  
**SEPTEMBER 30, 1988 AND 1987**

		1988	1987	
<b>ASSETS</b>	<b>Current Assets:</b>			
	Cash and cash equivalents	\$ 2,944,964	\$ 1,459,475	
	Cash investments	2,244,061	3,369,289	
	Trade receivables - less allowance for doubtful accounts: 1988, \$85,352; 1987, \$135,353	5,025,964	4,171,421	
	Inventories	4,109,264	3,335,251	
	prepaid expenses and other	725,964	122,370	
	<b>Total current assets</b>	<b><u>15,050,217</u></b>	<b><u>12,457,806</u></b>	
	<b>Property, Plant and Equipment:</b>			
	Land	356,217	296,217	
	Buildings and Improvements	5,476,155	4,837,392	
	Machinery and equipment	2,160,671	1,546,476	
	Transportation equipment	1,866,005	1,705,107	
	Office furniture and equipment	463,750	483,769	
	<b>Total</b>	<b><u>10,322,798</u></b>	<b><u>8,868,961</u></b>	
	Less accumulated depreciation	<u>4,705,580</u>	<u>4,207,598</u>	
	<b>Property - net</b>	<b><u>5,617,218</u></b>	<b><u>4,661,363</u></b>	
	<b>Other Assets:</b>			
	Intangible assets - less accumulated amortization: 1988, \$197,437; 1987, \$239,281	226,728	252,884	
	Insurance trust	1,122,796	1,066,964	
	Other	89,287	77,778	
	<b>Total other assets</b>	<b><u>1,438,811</u></b>	<b><u>1,397,626</u></b>	
	<b>Total</b>	<b><u>\$22,106,246</u></b>	<b><u>\$18,516,795</u></b>	
	<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>	<b>Current Liabilities:</b>		
		Current portion of long-term debt	\$ 17,902	\$ 32,405
		Accounts payable - trade	5,049,234	2,686,669
Accrued income taxes			21,400	
Accrued payroll and employee benefits		681,369	678,752	
Container deposits		1,054,373	1,199,263	
Other accruals		198,477	178,736	
<b>Total current liabilities</b>		<b><u>7,001,355</u></b>	<b><u>4,797,225</u></b>	
<b>Long-term debt</b>		<b><u>53,706</u></b>	<b><u>71,608</u></b>	
<b>Deferred income taxes</b>		<b><u>249,900</u></b>	<b><u>242,200</u></b>	
<b>Shareholders' Equity:</b>				
Common stock - authorized 4,000,000 shares of \$.05 par value, issued: 1988, 3,592,673; 1987, 3,268,337		179,634	163,417	
Additional paid-in capital		14,671,885	12,084,817	
Retained earnings (deficit)		<u>(50,234)</u>	<u>1,157,528</u>	
<b>Total shareholders' equity</b>		<b><u>14,801,285</u></b>	<b><u>13,405,762</u></b>	
<b>Total</b>		<b><u>\$22,106,246</u></b>	<b><u>\$18,516,795</u></b>	

See accompanying Notes to Financial Statements

available revenues -- it is added back to reported net income after taxes to get cash flow. Total debt is equal to the current debt for the current year plus the long term debt, since current debt includes that part of long-term debt that is due in the current year.

If the Beaver's Ratio is greater than 0.20 the discharger is considered to be solvent (i.e., can pay its long-term debts). If the ratio is less than 0.15 the discharger may be insolvent (i.e., go bankrupt). If the ratio is between 0.15 and 0.20, then future solvency is uncertain. The discharger's Beaver's Ratio should be compared with the ratios of similar dischargers. However, as with other ratios, it may not be possible to compare the discharger's ratio directly with other similar dischargers. In cases where a direct comparison cannot be made, the discharger's Beaver's Ratio should be compared with that of firms that concentrate in similar businesses, using information from income accounts and balance sheets in *Moody's Industrial Manual*. If the discharger's ratio compares favorably with similar businesses, it should be able to meet its fixed and long term obligations. A typical balance sheet and income statement have been included in Exhibits 3-4 (for calculating total debt) and 3-5 (for calculating cash flow). The appropriate data from them has been underlined.

### **Leverage**

Leverage tests measure the extent to which a firm already has fixed financial obligations and thus indicate how much more money a firm is capable of borrowing. Firms that rely heavily on debt may find it difficult and expensive to borrow additional funds. Most leverage tests compare equity to some measure of debt or fixed assets. The Debt to Equity Ratio is the most commonly used method of measuring leverage. Unlike the ratios discussed above, the debt to equity ratio cannot be easily calculated for a single facility; it must be calculated for the firm, since it is usually the firm, not the facility, that borrows money. The ratio measures how much the firm has borrowed (debt) relative to the amount of capital which is

## Worksheet K

### Calculation of Beaver's Ratio

$$\text{BR} = \text{CF} \div \text{TD}$$

Where:           BR = Beaver's Ratio  
                   CF = Cash Flow  
                   TD = Total Debt

#### Three Most Recently Completed Fiscal Years

	19__	19__	19__	
<b>Cash Flow:</b>				
Net Income After Taxes	\$ _____	\$ _____	\$ _____	(1)
Depreciation	\$ _____	\$ _____	\$ _____	(2)
CF [Calculate: (1) + (2)]	\$ _____	\$ _____	\$ _____	(3)
<b>Total Debt:</b>				
Current Debt	\$ _____	\$ _____	\$ _____	(4)
Long-Term Debt	\$ _____	\$ _____	\$ _____	(5)
Total Debt	\$ _____	\$ _____	\$ _____	(6)
<b>Beaver's Ratio:</b>				
BR [(3) / (6)]				(7)

**Considerations:**

Is the most recent year typical of the three years?    Yes    No  
 (If not, you might want to use an earlier year or years for the analysis)

Is the Beaver's Ratio for this discharger greater than 0.2?    Yes    No

Is the Beaver's Ratio for this discharger less than 0.15?    Yes    No

Is the Beaver's Ratio for this discharger between 0.2 and 0.15?    Yes    No

How does this ratio compare with the Beaver's Ratio for other firms in the same business?

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Exhibit 3-4

XYZ, INC.  
CONSOLIDATED  
BALANCE  
SHEETS  
SEPTEMBER 30, 1988 AND 1987

	1988	1987
<b>ASSETS</b>		
<b>Current Assets:</b>		
Cash and cash equivalents	\$ 2,944,964	\$ 1,459,475
Cash investments	2,244,061	3,369,289
Trade receivables - less allowance for doubtful accounts: 1988, \$85,352; 1987, \$135,353	5,025,964	4,171,421
Inventories	4,109,264	3,335,251
prepaid expenses and other	725,964	122,370
<b>Total current assets</b>	<b>15,050,217</b>	<b>12,457,806</b>
<b>Property, Plant and Equipment:</b>		
Land	356,217	296,217
Buildings and Improvements	5,476,155	4,837,392
Machinery and equipment	2,160,671	1,546,476
Transportation equipment	1,866,005	1,705,107
Office furniture and equipment	463,750	483,769
<b>Total</b>	<b>10,322,798</b>	<b>8,868,961</b>
Less accumulated depreciation	4,705,580	4,207,598
<b>Property - net</b>	<b>5,617,218</b>	<b>4,661,363</b>
<b>Other Assets:</b>		
Intangible assets - less accumulated amortization: 1988, \$197,437; 1987, \$239,281	226,728	252,884
Insurance trust	1,122,796	1,066,964
Other	89,287	77,778
<b>Total other assets</b>	<b>1,438,811</b>	<b>1,397,626</b>
<b>Total</b>	<b>\$22,106,246</b>	<b>\$18,516,795</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>		
<b>Current Liabilities:</b>		
Current portion of long-term debt	\$ 17,902	\$ 32,405
Accounts payable - trade	5,049,234	2,686,669
Accrued income taxes		21,400
Accrued payroll and employee benefits	681,369	678,752
Container deposits	1,054,373	1,199,263
Other accruals	198,477	178,736
<b>Total current liabilities</b>	<b>7,001,355</b>	<b>4,797,225</b>
<b>Long-term debt</b>	<b>53,706</b>	<b>71,608</b>
Deferred income taxes	249,900	242,200
<b>Shareholders' Equity:</b>		
Common stock - authorized 4,000,000 shares of \$.05 par value, issued: 1988, 3,592,673; 1987, 3,268,337	179,634	163,417
Additional paid-in capital	14,671,885	12,084,817
Retained earnings (deficit)	(50,234)	1,157,528
<b>Total shareholders' equity</b>	<b>14,801,285</b>	<b>13,405,762</b>
<b>Total</b>	<b>\$22,106,246</b>	<b>\$18,516,795</b>

See accompanying Notes to Financial Statements

## Exhibit 3-5

**XYZ, INC.  
CONSOLIDATED  
STATEMENTS OF  
INCOME AND  
RETAINED EARNINGS  
(DEFICIT)**

*FOR THE YEARS ENDED SEPTEMBER 30, 1988, 1987, 1986*

	1988	1987	1986
Net sales	\$42,389,957	\$33,294,962	\$30,730,768
Cost of sales	<u>35,981,363</u>	<u>26,405,930</u>	<u>24,972,185</u>
Gross profit	6,408,594	6,889,032	5,758,583
Selling, general and administrative expenses	<u>3,957,771</u>	<u>3,876,206</u>	<u>3,824,226</u>
Income from operations	2,450,823	3,012,826	1,934,357
Other income (deductions)			
Interest income	441,891	347,613	362,295
Interest expense	(10,985)	(22,513)	(46,467)
Other investment income - net			134,690
Miscellaneous	<u>55,066</u>	<u>48,660</u>	<u>93,654</u>
Total other income (deductions) - net	<u>485,972</u>	<u>373,760</u>	<u>544,172</u>
Income before income taxes	2,936,795	3,386,586	2,478,529
Provision for income taxes	<u>1,139,118</u>	<u>1,620,012</u>	<u>1,150,949</u>
Net income	<u>\$1,797,677</u>	<u>\$1,766,574</u>	<u>\$1,327,580</u>
Retained earnings, beginning of year	1,157,528	1,726,292	1,983,007
Stock dividend	(2,610,888)	(1,952,645)	(1,365,590)
Cash dividend (\$.11 per share, 1988; \$.08 per share, 1987; \$.06 per share, 1986)	(391,960)	(300,693)	(218,705)
Common stock acquired and retired	<u>(2,591)</u>	<u>(82,000)</u>	
Retained earnings (deficit), end of year	<u>\$ (50,234)</u>	<u>\$ 1,157,528</u>	<u>\$ 1,726,292</u>
Weighted average number of shares outstanding	<u>3,593,048</u>	<u>3,630,652</u>	<u>3,637,798</u>
Earnings per common share	<u>\$.50</u>	<u>\$.49</u>	<u>\$.36</u>

See accompanying Notes to Financial Statements

**INDEPENDENT  
AUDITORS'  
REPORT**

To the Shareholders of XYZ, Inc.:

We have audited the consolidated balance sheets of XYZ, Inc. at September 30, 1988 and 1987, and the related consolidated statements of income and retained earnings (deficit), and cash flows for each of the three years in the period ended September 30, 1988. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the financial position of the companies at September 30, 1988 and 1987, and the results of their operations and their cash flows for each of the three years in the period ended September 30, 1988 in conformity with generally accepted accounting principles.

DELOITTE HASKINS & SELLS

Minneapolis, Minnesota

December 5, 1988

owned by its stockholders (equity). Since values for the Debt to Equity Ratio vary widely by the type of enterprise, the ratio should be compared with the ratio for firms in similar lines of business. The ratio also should be calculated with at least three years of data.

The Debt to Equity Ratio is equal to Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities like deferred income taxes) divided by Owners' Equity. Owner's Equity is the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings. For publicly held firms, use Net Stockholders Equity (which is the equivalent of Total Stockholder Equity minus any Treasury Stock).

$$\text{Debt/Equity Ratio} = \frac{\text{Long-Term Liabilities}}{\text{Owners' Equity}}$$

The Debt to Equity Ratio can be calculated using **Worksheet L**. Since there are no generally accepted Debt/Equity Ratio values that apply to all types of economic activity, the ratio should be compared with the ratio of firms in similar businesses. If the entity's ratio compares favorably with the median or upper quartile ratio for similar businesses, it should be able to borrow additional funds. These ratios can be calculated using data in Robert Morris Associates' *Annual Statement Studies*, *Moody's Industrial Manual*, and Dun & Bradstreet's *Dun's Industry Norms*. Pages from these sources have been included in Exhibits 3-6 and 3-7, with the appropriate data indicated.

For entities with special sources of funding, leverage is not an appropriate measure of their ability to raise capital. Examples are agriculture and affordable housing, where special loan programs may be available. In these cases, an analysis of the probability that the project would receive this money is appropriate.

## Worksheet L

### Debt to Equity Ratio

$$\text{DER} = \text{LTL} \div \text{OE}$$

Where: DER = Debt/Equity Ratio  
LTL = Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)  
OE = Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

#### Three Most Recently Completed Fiscal Years

	19__	19__	19__	
LTL	\$ _____	\$ _____	\$ _____	(1)
OE	\$ _____	\$ _____	\$ _____	(2)
DER [(1)/(2)]	<input type="text"/>	<input type="text"/>	<input type="text"/>	(3)

#### Considerations:

Is the most recent year typical of the three years?  Yes  No  
(If not, you might want to use an earlier year or years for the analysis)

How does the Debt to Equity Ratio compare with the ratio for firms in the same business?

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Exhibit 3-7

XYZ, INC.  
CONSOLIDATED  
BALANCE  
SHEETS  
SEPTEMBER 30, 1988 AND 1987

	1988	1987
<b>ASSETS</b>		
<b>Current Assets:</b>		
Cash and cash equivalents	\$ 2,944,964	\$ 1,459,475
Cash investments	2,244,061	3,369,289
Trade receivables - less allowance for doubtful accounts: 1988, \$85,352; 1987, \$135,353	5,025,964	4,171,421
Inventories	4,109,264	3,335,251
prepaid expenses and other	<u>725,964</u>	<u>122,370</u>
<b>Total current assets</b>	<b>15,050,217</b>	<b>12,457,806</b>
<b>Property, Plant and Equipment:</b>		
Land	356,217	296,217
Buildings and Improvements	5,476,155	4,837,392
Machinery and equipment	2,160,671	1,546,476
Transportation equipment	1,866,005	1,705,107
Office furniture and equipment	<u>463,750</u>	<u>483,769</u>
<b>Total</b>	<b>10,322,798</b>	<b>8,868,961</b>
Less accumulated depreciation	<u>4,705,580</u>	<u>4,207,598</u>
<b>Property - net</b>	<b>5,617,218</b>	<b>4,661,363</b>
<b>Other Assets:</b>		
Intangible assets - less accumulated amortization: 1988, \$197,437; 1987, \$239,281	226,728	252,884
Insurance trust	1,122,796	1,066,964
Other	<u>89,287</u>	<u>77,778</u>
<b>Total other assets</b>	<b>1,438,811</b>	<b>1,397,626</b>
<b>Total</b>	<b><u>\$22,106,246</u></b>	<b><u>\$18,516,795</u></b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>		
<b>Current Liabilities:</b>		
Current portion of long-term debt	\$ 17,902	\$ 32,405
Accounts payable - trade	5,049,234	2,686,669
Accrued income taxes		21,400
Accrued payroll and employee benefits	681,369	678,752
Container deposits	1,054,373	1,199,263
Other accruals	<u>198,477</u>	<u>178,736</u>
<b>Total current liabilities</b>	<b>7,001,355</b>	<b>4,797,225</b>
<b>Long-term debt</b>	<b>53,706</b>	<b>71,608</b>
Deferred income taxes	249,900	242,200
<b>Shareholders' Equity:</b>		
Common stock - authorized 4,000,000 shares of \$.05 par value, issued: 1988, 3,592,673; 1987, 3,268,337	179,634	163,417
Additional paid-in capital	14,671,885	12,084,817
Retained earnings (deficit)	<u>(50,234)</u>	<u>1,157,528</u>
<b>Total shareholders' equity</b>	<b>14,801,285</b>	<b>13,405,762</b>
<b>Total</b>	<b><u>\$22,106,246</u></b>	<b><u>\$18,516,795</u></b>

See accompanying Notes to Financial Statements

### 3.3 Interpreting the Results

The financial analysis should be used to determine if there will be a substantial adverse impact on the applicant. As indicated above, the Profit Test should be considered first. The Profit Test measures what will happen to the discharger's earnings if additional pollution control is required. If the discharger is making a profit now but would lose money with the pollution control, then the possibility of a total shutdown or the closing of a production line must be considered. Likewise in the case of a proposed facility; if it would make money without the pollution control but would make much less or even lose money with it, then the development might not take place. In either case, there is the chance that employment will be lost and local purchases by the discharger reduced. Whether or not these impacts will be considered widespread is addressed in Chapter 4.

There are several more complicated scenarios that all involve making a judgement as to the likely impacts on the discharger, including questions of the timing of compliance. For example, the Profit Test may indicate that the applicant will continue to maintain profit levels typical for its industry after compliance, but the Debt/Equity Ratio may indicate that they will have trouble raising the required capital through debt. This problem may be solved by giving them more time to meet the regulations (a variance), so that they can restructure their debt and/or find alternative sources of funds. In another case, the applicant might argue that while they will still make money and be able to raise the needed capital, they would alternatively spend those funds on an expansion which would have resulted in increased employment and income for the community. This is a more difficult situation to analyze, and will depend on judgments about the relative importance of water pollution control versus economic growth. These issues are discussed in more detail in Chapter 4.

Another possible scenario is that the discharger may shift to an alternative economic activity (e.g., manufacture another product or produce a different crop). While the

applicant will not have gone out of business, this shift may result in reduced profits, employment, and purchases in the local community that must be considered. In each case, it is important to take the entire picture presented by the four ratios into account in judging whether or not the discharger will incur substantial impacts due to the cost of the necessary pollution reductions.

Using the guidance presented in this chapter, applicants that feel they have demonstrated substantial impacts should proceed to Chapter 4: Determination of Widespread Impacts. If dischargers are not able to demonstrate substantial impacts, the entity must will not be able to justify water quality standards providing for less protection than the fishable/swimmable goals of the Act, and will not be able to justify degradation of high quality waters. If a group of dischargers within the community will experience the substantial impacts resulting from meeting the fishable/swimmable goals of the Act and avoiding degradation of high quality waters, these impacts should be considered jointly when assessing whether or not the impacts will be widespread.

#### **4. DETERMINATION OF WIDESPREAD IMPACTS**

The financial impacts of undertaking pollution controls could potentially cause far-reaching and serious socioeconomic impacts. If the financial tests outlined in Chapter 2 and 3 suggest that a discharger (public or private) or group of dischargers will have difficulty paying for pollution controls, then an additional analysis must be performed to demonstrate that there will be widespread adverse impacts on the community or surrounding area. There are no economic ratios per se that evaluate socioeconomic impacts. Instead, the relative magnitudes of indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees for remaining private entities should be taken into account when deciding whether impacts could be considered widespread. Since EPA does not have standardized tests and benchmarks with which to measure these impacts, the following guidance is provided as an example of the types of information that should be considered when reviewing impacts on the surrounding community.

In certain circumstances, the information presented here may not adequately address all potential impacts. At a minimum, however, the analysis must define the affected community (the geographic area where project costs pass through to the local economy), consider the baseline economic health of the community, and finally evaluate how the proposed project will affect the socioeconomic well-being of the community. Applicants should feel free to consider additional measures not mentioned here if they judge them to be relevant. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally, rather, their cumulative effect on the community should be assessed. More detailed guidance on the factors that should be considered when evaluating the socioeconomic impacts to communities of meeting water quality standards is given below.

*Economic Guidance for Water Quality Standards*

#### **4.1 Define Relevant Geographical Area**

One important factor in determining the magnitude of these impacts is defining the geographical area in which they occur. In some cases, one community's loss may be another community's gain, as in the case of a plant moving to another community. In the case of municipal pollution control projects, the affected community is most often the immediate municipality. There are, however, exceptions where the affected community includes individuals and areas outside the immediate community. For example, if business activity in the region is concentrated in a nearby community and not in the immediate community, then the nearby community may also be affected by loss of income in the immediate community and should be included in the analysis. If business activity of the region is concentrated in the immediate community, then outlying communities dependent upon the immediate municipality for employment, goods, and services should also be included in the analysis. Similarly, if a large number of workers commute to an industrial facility that is significantly affected by the costs, then the affected community should include the home communities of commuters as well as the immediate community.

The relevant geographic area for evaluating the socioeconomic effects of compliance by private entities varies with each situation. For impacts from actions by a private entity, the area will typically be determined by the area in which the majority of its workers live and where most of the businesses that depend on it are located. There are no simple rules for defining the relevant area or community; the decision is based on the judgement of the discharger and state, subject to EPA review.

#### **4.2 Determine Whether Impacts are Widespread: Public-Sector Entities**

In demonstrating that impacts will be substantial, the applicant will have shown that compliance with water quality standards would be burdensome to the community. To demonstrate that impacts will also be widespread, the

applicant must examine the estimated change in socioeconomic conditions that occur as a result of compliance.

There are no explicit criteria by which to evaluate widespread impacts. It is recommended, however, that changes in the socioeconomic indicators listed below be considered. For each indicator listed, the applicant should estimate the potential change from precompliance conditions if the community were to adopt pollution controls.

- Median Household Income;
- Community Unemployment Rate;
- Overall Net Debt as a Percent of Full Market Value of Taxable Property;
- Percent of Households Below Poverty Line;
- Impact on Community Development Potential; and
- Impact on Property Values.

Precompliance estimates of the first three indicators were considered in Chapter 2 in the Secondary Test. Estimated changes should be described qualitatively in **Worksheet M**. Depending on the size and type of impacts on industrial and commercial discharges, these estimated changes may be relatively large or small. In addition to changes in income, unemployment, and debt, affected communities may be faced with impaired development opportunities if pretreatment requirements or significantly higher user fees are imposed by the POTW. The municipality should therefore assess the potential for the loss of future jobs and personal income to the community if businesses would chose not to locate in the affected community. The potential for impaired development opportunities can be judged, in part, by comparing post-compliance costs to costs in neighboring communities. The cost of pollution control may also have an adverse effect on property values. Where property taxes are used to finance the project, property values may fall in response to higher taxes. Similarly, if the project will be financed through user fees, demand for property in the community may fall, thus decreasing the value of property in the community.

**Worksheet M**

**Qualitative Description of Estimated change  
in Socioeconomic Indicators  
due to Pollution Control Costs**

Estimated change  
in Median  
Household  
Income (MHI)

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Estimated change  
in the  
unemployment  
rate

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Estimated change  
in overall net debt  
as a percent of  
full market value  
of taxable  
property

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Estimated change  
in % of  
households below  
the poverty line

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Impact on  
commercial  
development  
potential

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Impact on  
Property Values

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The extent to which estimated changes can be interpreted as significant, however, will depend on the health of the community before compliance. It is therefore not possible to identify acceptable or unacceptable estimated changes for each indicator. For example, if Community XYZ were determined to be in a weak condition before compliance. As defined in Chapter 2, but the evaluation of widespread impacts suggests that all of the indicators listed above will remain virtually unchanged, then widespread impacts have not been demonstrated. Alternatively, if Community XYZ were very healthy, the estimated change in the indicators listed above would have to be very large in order for widespread impacts to occur.

In addition, there may be secondary impacts (not captured by the primary and secondary tests) to the community. Secondary impacts might include depressed economic activity in a community resulting from loss of purchasing power by persons losing their jobs due to increased user fees. The next section describes secondary impacts in greater detail.

#### **4.3 Determine Whether Impacts are Widespread: Private-Sector Entities**

If the financial tests suggest that a private entity or group of entities will have difficulty paying for pollution controls, then an additional analysis must be performed to demonstrate that there will be widespread adverse impacts on the community or surrounding area. The current economic condition of the affected community and the role of the affected entities within the community should first be considered when determining whether the affected community will be able to absorb the impacts of reduced business activity or closures. Through property taxes and employment, the entity(ies) may be a key contributor to the economic base of the affected community. In this situation, reductions in employment caused by compliance with the water quality standards could be widespread if workers have no other employment opportunities nearby. Impacts may also be significant where the entity(ies) is a

primary producer of a particular product or service upon which other nearby businesses or the affected community depend. The impacts of reduced business activities or closure will be far greater in this case than if the products are sold elsewhere. These two examples illustrate how the interdependence between the affected entity(ies) and the affected community is a major factor in demonstrating that the impacts are not only substantial, but also widespread.

As important as the extent of socioeconomic impacts is the type of impacts that might occur. A worksheet has been provided to assist applicants in their evaluation of socioeconomic impacts. **Worksheet N** is designed as a list of the factors applicants should consider in determining whether impacts are not only substantial but also widespread. The worksheet is organized to follow the text below. To make the most efficient use of this worksheet, applicants should read the remainder of Section 4.3 and then collect the data suggested in the worksheet. Applicants should feel free, however, to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

Potentially, one of the most serious impacts on the affected community's economy is the loss of employment caused by a reduction in business activity or closure. The size of this impact is dependent on the number of jobs lost relative to the total number of jobs in the community, and to the job opportunities available in the community. Typically, a decline in employment leads to a decline in personal income in the affected community. The total amount of income lost by the affected community will depend, in part, on the future job prospects of those losing their jobs. If employees leave the area in search of opportunities, all of their income will be lost to the affected community. Workers who are unable to market the full range of their skills to a new employer will receive lower wages in subsequent jobs. If employees stay in the area and find lower paying jobs or receive unemployment benefits, the loss of income to the affected community would be equal to the difference between existing and

## Worksheet N

### Factors to Consider in Making a Determination of Widespread Social and Economic Impacts

- Define the affected community in this case; what areas are included. \_\_\_\_\_ (1)
- Current unemployment rate in affected community (if available). \_\_\_\_\_ (2)
- Current national unemployment rate. \_\_\_\_\_ (3)
- Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards. \_\_\_\_\_ (4)
- Expected unemployment rate in the affected community after compliance with water quality standards (Current # of persons collecting unemployment in affected community + (4)/labor force in affected community. \_\_\_\_\_ (5)
- Median household income in affected community. \_\_\_\_\_ (6)
- Total number of households in affected community. \_\_\_\_\_ (7)
- Percent of population below the poverty line in affected community. \_\_\_\_\_ (8)
- Current expenditures on social services in affected community. \_\_\_\_\_ (9)
- Expected expenditures on social services due to job losses in the affected community. \_\_\_\_\_ (10)
- Current total tax revenues in the affected community. \_\_\_\_\_ (11)
- Tax revenues paid by the private entity to the affected community. \_\_\_\_\_ (12)

**Worksheet N, continued**

Tax revenues paid by the private entity as a percentage of the affected community's total tax revenues.*	_____	(13)
Current statewide unemployment rates.	_____	(14)
Additional number of persons expected to collect unemployment in the State due to compliance with water quality standards.	_____	(15)
Expected statewide unemployment rate, after compliance with water quality standards (Current # of persons collecting unemployment in State + (15)/labor force in State.	_____	(16)
Current expenditures on social services in State.	_____	(17)
Expected statewide expenditures on social services due to job losses.	_____	(18)

\* In some cases, the affected community will include more than just the municipality in which the private entity is located. If so, the analysis should consider the private entity's tax revenues as a percentage of the tax revenues for only the municipality in which the entity is located.

future income; the cost of unemployment benefits is calculated as a government expense or an expense borne someplace else, whichever is appropriate to the situation.

To assess the net impact on employment in the affected community, the existing rate of unemployment should be considered as an indicator of worker mobility between jobs. When the unemployment rate is very high in an affected community, workers will have a difficult time finding other jobs in that community. Where possible, comparisons should be made between industry employment levels in the community and the nation as a whole. If employment levels in the industry as a whole are falling, the industry may be in decline regardless of the burden placed on them by water quality standards regulations. If it is clear that a private-sector entity will go out of business regardless of water quality standards, the impact of the pollution controls should not be viewed as substantial. If the entity is in a marginal position, however, the effect that meeting water quality standards will have on the entity and the community should be considered. Applicants should also consider whether the lack of alternative employment opportunities may lead to an increased need for social services in the affected community. If the costs of increased social services will be borne by the affected community, they should be included in the assessment of widespread and substantial impacts.

Socioeconomic impacts may also include effects on the local government(s) such as loss of property tax revenues. If the financial tests in Chapter 3 suggest that an entity or group of entities will close, then the assessed value of property and tax revenues will fall. If the entities are a major source of revenue for the affected community, this loss in tax revenue may be significant. One example might be water quality standards that affect farming practices in an agricultural region. Compliance with these standards might lower the profitability of many farms, even to the point of forcing them to cease operations. To assess the impact, the loss in property tax revenues should be compared to total property tax revenues in the affected community to determine the relative size of the loss. In

general, a drop of 1 percent in property tax revenues would be considered significant.

If compliance is evaluated in the context of a public investment for which the private entity is paying a share (e.g., a factory's share of the cost to upgrade a municipal treatment plant), then the analysis of widespread impacts is more complicated. If the financial analysis shows that the entity or group of entities cannot pay their share of the cost, then the socioeconomic and public entity analysis should include this additional burden on other users. Likewise, if the entity or group of entities are significant users of the local utilities, then a reduction in business activity or closure may lead to a lowered demand and possible decreased efficiency for local utilities. For example, a water supply system may be designed with a large industrial user in mind. If much of the demand is eliminated, the system may become excessively expensive for the remaining users.

Affected communities may also be faced with impaired development opportunities if the need to comply with water quality standards discourages other businesses from locating in the area. In situations where the affected facility has not been built, additional expenditures on water pollution controls may delay or cancel the construction. The applicant should, therefore, consider not only the loss of potential jobs and personal income to the community if the entity is not built, but the future losses in jobs, personal income and tax revenues from other businesses that would choose not to locate in the affected community.

There may be some cases in which the socioeconomic impacts of implementing pollution controls are large enough that they are felt at the state level. For example, the State may lose tax revenues from lost production and lost income if a business closes. This will be of particular importance if the business is a major employer in the State and/or the State is experiencing a period of high unemployment and fiscal distress. At the same time, the State may encounter increased expenditures for unemployment compensation and social services. In

reviewing state level impacts, the applicant should consider the degree to which decreases in employment and personal income in one area of the State are offset by increases in employment and personal income in other parts of the State. In most cases, impacts at the state level will be relatively minor. If not, then impacts are widespread.

#### **4.4 Estimate Multiplier Effect**

The effects of increased unemployment, decreased personal income, and reductions in local expenditures by the entity or group of entities (public and private) will be compounded as money moves through the local economy. Some portion of the lost income would have been spent in the local economy for the purchase of other goods and services and thus for the salaries of other local employees. These local employees, in turn, would have spent some portion of their income in the local economy. This multiplier effect means that each dollar lost to an employee results in the loss of more than one dollar to the local economy.

The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) has developed several multipliers to estimate the effect of reduced economic activity on output (sales), earnings, and employment. These multipliers are available by industry sector for 39 or 531 different industry classifications, depending on the level of detail required. Applicants that are interested in using these multipliers are advised to consult a copy of *RIMS II Regional Multipliers: A User Handbook of the Regional Input-Output Modeling System*, available from the National Technical Information Service (NTIS). The NTIS document number is #PB-86-230-216 and orders can be placed by calling NTIS at (703) 487-4650. Additional information on using multipliers is available from the BEA at (202) 606-5343.

#### **4.5 Economic Benefits of Clean Water**

**Benefit-cost analysis is not required to demonstrate substantial and widespread effects under the Federal Water Quality Standards regulation.**

In many cases, there may be economic benefits that accrue to the affected community from cleaner water. For example, in a rural community where the primary source of employment is agriculture, the reduction of fertilizer and pesticide runoff from farms would reduce the cost of treating irrigation water to downstream users. Another example might be an industrial facility discharging its wastewater into a stream that otherwise could be used for recreational cold-water fishing. Treatment or elimination of the industrial wastewater would provide a benefit to recreational fishermen by increasing the variety of fish in the stream. In both cases, the economic benefit is the dollar value associated with the increase in beneficial use or potential use of the waterbody. The types of economic benefits that might be realized will depend on both the characteristics of the polluting entity and characteristics of the affected community, and should be considered on a case by case basis.

Since the assessment of benefits requires site-specific information, it will be up to States to determine the extent to which benefits can be considered in the economic impact analysis. This determination should be coordinated with the EPA Regional Office. A more detailed description of the types of benefits that might be considered is given in Appendix C. This appendix is not intended to provide in-depth guidance on how to estimate economic benefits; rather, it is intended to give States an idea of the types of benefits that might be relevant in a given situation.

#### **4.6 Summary of Financial Capability and Determination of Whether Impacts are Substantial and Widespread**

Using the guidance described in this document, the applicant must demonstrate that the pollution control measures needed to meet the fishable/swimmable goals of the Act are not affordable. In addition, the applicant will have to show that there will be widespread adverse impacts to the community if it is required to meet standards. A summary checklist of the steps required in this process is presented in Table 4-1. This checklist also presents the type of data the applicant will need to collect to support each step. Whether or not the applicant has successfully demonstrated that substantial and widespread economic and social impacts would occur, however, will depend upon the EPA Regional Administrator's review of the application.

If the EPA Regional Administrator determines that substantial and widespread economic and social impacts have not been demonstrated, then the discharger must meet the fishable/swimmable goals of the Act. Alternatively, if substantial and widespread economic and social impacts have been demonstrated, then the discharger will not have to meet the water quality standards. The discharger will, however, be expected to undertake some additional pollution control. The criteria outlined in Chapters 2 and 3 should be used to determine the most protective pollution control technique that would not impose a substantial impact on the entity. In addition, the discharger should check with EPA and the State regularly to determine what else will be required of them. It is then up to the State to revise the standards in the water body to reflect the uses that would be achieved if the discharger adopts the next most protective pollution control technique. The State will also have to revise its water quality criteria to protect the newly attainable uses. The discharger's NPDES permit will then be revised to reflect the new limits associated with revised criteria. Finally, federal regulations require that water quality standards be reviewed every three years to determine if there is any new information or technology

that allows attainment of the goal uses of the Act without causing substantial and widespread social and economic impacts.

**Table**  
**Demonstration of Substantial and Widespread**  
**Economic and Social Impacts of Attainment of Designated Uses**

**CHECKLIST**

<b>STEPS</b>	<b>INFORMATION THAT WILL BE REQUIRED FROM APPLICANT</b>
1. Demonstrate that designated use is a potential use and not an existing use.	Data from State Water Quality Assessment Documents and water quality standards regulations.
2. Demonstrate that entity will incur substantial economic impacts.	
a. Identify all reasonable pollution reduction options,	<p>Information on end-of-pipe treatment, possible treatment upgrades, additions to existing treatment, and pollution prevention activities including the following:</p> <ul style="list-style-type: none"> <li>• change in raw materials,</li> <li>• substitution of process chemicals,</li> <li>• change in process,</li> <li>• water recycling, reuse and efficiency,</li> <li>• pretreatment requirements, and</li> <li>• public education.</li> </ul>
b. Evaluate costs of all reasonable pollution reduction options,	Assumptions about water demand, treatment capacity, expansion plans, population growth, and effectiveness of control in reducing pollution for each option. Estimate of project costs from design engineers, costs of comparable projects in the State, or judgement of experienced water pollution control engineers.
c. Identify lowest cost pollution reduction option that allows entity to meet water quality standards.	Information on treatment efficiencies for alternative pollution reduction techniques. Cost estimates for all alternatives.

**Table 4-1 CHECKLIST (Cont'd.)**

STEPS	INFORMATION THAT WILL BE REQUIRED FROM APPLICANT
3. Evaluate entity's financial health ( <b>Public Entities Only</b> ):	
a. determine method of financing,	Information on user fee financing mechanisms such as Revenue Bonds. Information on tax based financing mechanisms such as General Obligation Bonds.
b. annualize pollution reduction project costs,	Information on appropriate interest rates and period of financing.
c. allocate project costs,	Information on user groups, wastewater flow by user group, and surcharges on industrial users.
d. apply Municipal Preliminary Screener test,	Information on average total annual pollution control cost per household and median household income.
e. Depending on the results of the Municipal Preliminary Screener test, apply Secondary Test.	Information on results of Municipal Preliminary Screener test, overall net debt as a percent of full market value of taxable property, median household income, bond rating, community unemployment rate, property tax collection rate, and property tax revenues as a percent of full market value of taxable property.
4. Evaluate entity's financial health ( <b>Private Entities Only</b> ):	
a. annualize pollution reduction project costs,	Information on appropriate interest rates and period of financing.
b. Primary Measure:  profitability,	Information that will allow evaluation of whether an entity will remain profitable after incurring the cost of pollution reduction including: <ul style="list-style-type: none"> <li>• revenues,</li> <li>• cost of goods sold,</li> </ul>

Table 4-1 CHEA IST (Cont'd.)

**STEPS**

**INFORMATION THAT WILL BE REQUIRED FROM APPLICANT**

c. Secondary measures:

- portion of corporate overhead assigned to the entity, and
- total annualized pollution reduction project costs.

solvency,

Information that will allow evaluation of the entity's ability to meet its fixed and long-term obligations including:

- long-term debt,
- current debt,
- net income after taxes, and
- depreciation.

liquidity, and

Information that will allow evaluation of how easily an entity can pay its short-term bills such as:

- current assets,
- current liabilities, and
- total annualized pollution reduction project costs.

leverage.

Information that will allow evaluation of the extent to which a firm already has fixed financial obligations and therefore how much money it will be able to borrow including, long-term liabilities and owner equity.

5. Determine whether impacts are widespread (Public Entities Only):

a. Evaluate change in socioeconomic conditions that occur as a result of compliance.

Information on changes in median household income, community unemployment rate, overall net debt as a percent of full market value of taxable property, percent of households below the poverty line, impact on community development potential, and impact on community property values resulting from compliance.

**Table 4-1 CHECKLIST (Cont'd.)**

<b>STEPS</b>	<b>INFORMATION THAT WILL BE REQUIRED FROM APPLICANT</b>
6. Determine whether impacts are widespread ( <b>Private Entities Only</b> ):	
a. Define community,	Information on the geographical boundary of the area in which the majority of the entity's workers live and where most of businesses that depend on the entity are located.
b. Evaluate effect on employment,	Current unemployment, change in unemployment due to investment in pollution reduction.
c. Evaluate effect on tax revenues,	Information on the likely effect on assessed value of property tax revenues if the entity must adopt pollution reductions.
d. Assess impairment of development opportunities,	Information on the likelihood that the need to adopt pollution reductions in the affected community would discourage other businesses from locating in the area in the future.
e. Collect any relevant additional information that demonstrates widespread socioeconomic impacts.	Any additional information that suggests that there are unique conditions in the affected community that should also be considered.
7. Evaluate economic benefits of cleaner water.	Information on potential benefits of cleaner water including enhanced recreational opportunities, reduced treatment costs for downstream users and increased property values.
8. Public comment and debate period.	Be prepared to supply backup information on the application to modify or change a designated use to the public.

**Table 4-1 CHE LIST (Cont'd.)**

<b>STEPS</b>	<b>INFORMATION THAT WILL BE REQUIRED FROM APPLICANT</b>
9. If substantial and widespread economic and social impacts are demonstrated, determine which pollution reduction option should be implemented.	Information on the cost and efficiency of affordable pollution reduction alternatives.
10. Redesignate uses.	Uses will be determined by the level of "affordable" pollution reduction.
11. Standards will be adopted to protect new uses.	Once uses are established, standards should be revised to protect those uses.
12. Effluent limits and permits will be modified.	Limits will be modified to reflect effluent concentrations associated with the "affordable" pollution reduction technique.
13. Re-evaluate water quality standards in three years.	Per federal regulations, water quality standards must be revised every three years to determine if there is any new information or technology that allows attainment of the full designated uses without causing a substantial and widespread economic and social impact.

## **5. ANTIDegradation: ROLE OF ECONOMIC ANALYSIS**

Under the Water Quality Standards program, each State must develop, adopt and retain a statewide antidegradation policy and establish procedures for its implementation. The antidegradation policy is intended to maintain existing uses and the level of water quality necessary to protect those uses. In only limited cases, economic grounds can be used to allow for a lowering of water quality. In particular, if the quality of the water exceeds levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e. "high-quality water"), then economic considerations can be taken into account (unless the water has been designated an ONRW.). Before any lowering of water quality in high-quality waters, however, an antidegradation review must determine that the lowering is necessary in order to accommodate important economic or social development in the area in which the waters are located.

Antidegradation is not a "no growth" rule and was never designed nor intended to be one. It is a policy that allows the public to make decisions about important environmental actions. Where the State intends to provide for development, it may decide that some lowering of water quality in "high-quality waters" is necessary to accommodate important economic or social development. Any such reduction in water quality, however, must protect existing uses fully and must satisfy the requirements for intergovernmental coordination and public participation.

While the terminology is different, the tests to determine substantial and widespread economic impacts (used when removing a use or granting a variance) are basically the same as those used to determine if there might be interference with an important social and economic development (antidegradation). As such, antidegradation analysis is the mirror image of the analyses described in Chapters 2, 3 and 4. Variances and downgrades refer to situations where additional treatment needed to meet standards may result in worsening economic conditions;

*Economic Guidance for Water Quality Standards*

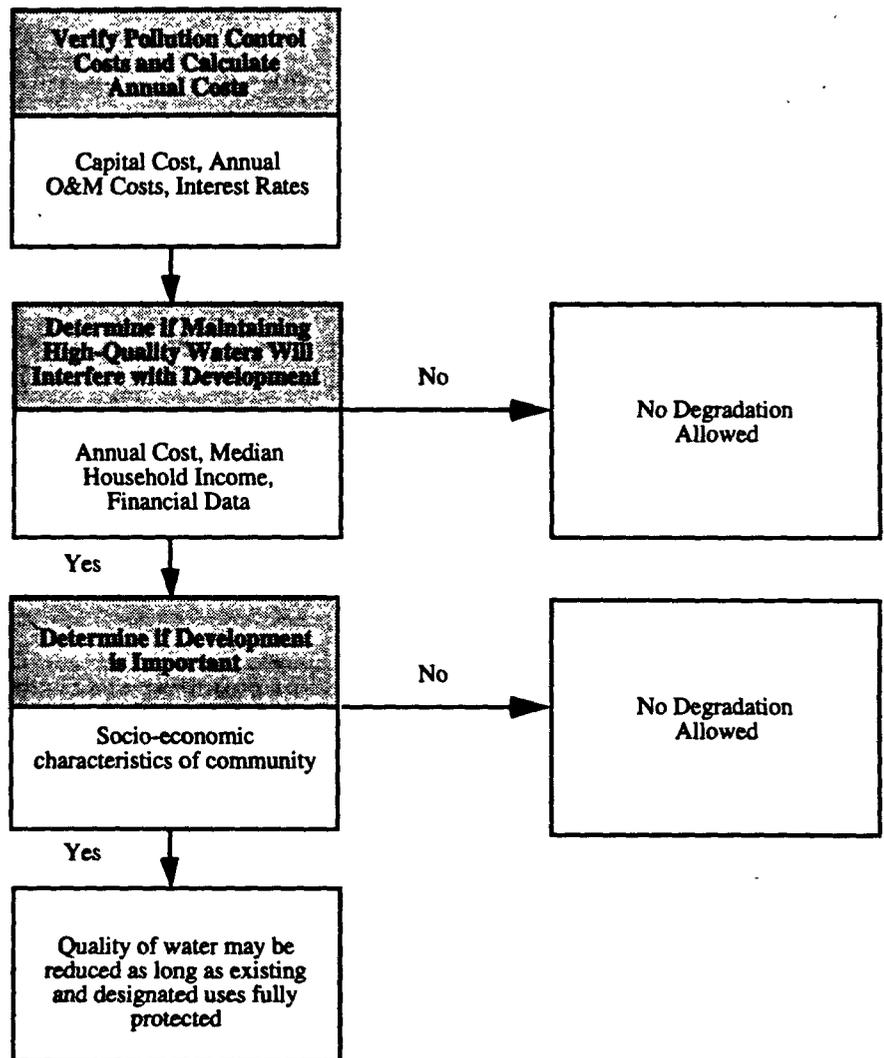
while antidegradation refers to situations where lowering water quality may result in improved social and economic conditions.

When performing an antidegradation review, the first question is whether the pollution controls needed to maintain the high-quality water will interfere with the proposed development. If not, then the lowering of water quality is not warranted. If, on the other hand, the pollution controls will interfere with development, then the review must show that the development would be an important economic and social one. These two steps rely on the same tests as the determination of substantial and widespread impacts. It should be stressed at the outset that substantial economic impacts does not mean driving profits to zero, nor precluding all other municipal expenditures.

The following sections describe the steps involved in performing an economic impact analysis as part of an antidegradation review. These steps are outlined in Figure 5-1. The analytic approach presented here can be used for a variety of public-sector and private-sector entities, including POTWs, commercial, industrial, residential and recreational land uses, and for point and nonpoint sources of pollution. The guidance provided in this chapter, however, is not meant to be exhaustive. The State and/or EPA may require additional information or tests. In addition, the applicant should feel free to include any additional information they feel is relevant. The steps described in further detail in the rest of the chapter are:

- **Verify Project Costs and Calculate the Annual Cost of the Pollution Control Project** - This section describes the factors considered when verifying that the proposed pollution control project is the most appropriate solution and the type of information that should be provided about the proposed project. It discusses how to annualize capital costs of the project and calculate total annual costs of the pollution control project.

**Figure 5-1:  
Antidegradation Review**



- **Determine if Requirements would Interfere with Development (i.e., lower water quality is "necessary")** - This section describes the types of financial tests that should be used to determine if maintaining the high-quality water would interfere with the development.
- **Determine if Economic and Social Development would be Important** - This section presents factors to be considered in determining whether the development would be important from an economic and social point of view.

These steps closely parallel the analytic techniques presented in Chapters 2, 3, and 4. These chapters should be read for more detail.

## **5.1 Verify Project Costs and Calculate The Annual Cost of the Pollution Control Project**

Before the impact analysis can be performed, the project costs should be verified and the annual costs calculated. Both private-sector and public-sector entities should consider a broad range of discharge management options including pollution prevention, end-of-pipe treatment, and upgrades or additions to existing treatment.

Whatever approach, the discharger must demonstrate that the proposed project is the most appropriate means of meeting water quality standards and must document project cost estimates. If there is at least one of the treatment alternatives that allows the applicant to maintain high-quality water without incurring substantial impacts, then they have failed to show that the requirements would interfere with the development. Cost information, and the assumptions underlying the cost estimates, should be supplied on Worksheet O.

The following two sections (5.1.a and 5.1.b) discuss analyzing public-sector projects. Section 5.1.c discusses private sector projects.

### **5.1.a Public-Sector Developments: Calculate the Annual Costs of the Pollution Control Project**

Since capital costs typically will be paid over several years, annualized costs are used in the evaluation of economic burden to the community. The capital portion of public-sector project costs is typically financed over approximately 20 years, by issuing a municipal debt instrument such as a general obligation bond or a revenue bond.

The calculation of total annualized cost of the project is presented in Worksheet P. First, capital costs are summed and the portion of costs to be paid for with grant monies are deducted, as these costs will not need to be financed. Next, the annualization factor is calculated using the formula supplied on Worksheet P, or the annualization

factor is found in Appendix B. Annualized capital cost is then calculated by multiplying the total capital costs to be financed by the annualization factor.

The interest rates used to annualize costs are dependent on the type of debt instrument used as well as the issuer's credit standing. Therefore, the interest rate used on **Worksheet P** reflects the debt instrument (i.e. municipal bond, commercial bank loan, state revolving fund loan, or other instrument) likely to be used by the municipality.

Next, annual operating and maintenance costs are added to the annualized capital cost. O&M costs should include the costs of monitoring, inspection, permitting fees, waste disposal charges, repair, administration, replacement, and any other recurring costs. All recurring costs should be stated in terms of dollars per year. The sum of the annualized capital cost and total annual operating and maintenance costs is the total annual cost of the project.

#### **5.1.b Public-Sector Developments: Calculate Total Annualized Pollution Control Costs Per Household**

To assess the burden that total pollution control costs are expected to have on households, an average annualized pollution control cost per household should be calculated for all households in the community that would bear project costs. In order to evaluate substantial impacts, therefore, the analysis must establish which households will actually pay for pollution control and what proportion of the costs will be borne by households. Then, these apportioned project costs are added to existing pollution control costs paid by the households.

It is important to define the affected community. The "community" is the governmental jurisdiction or jurisdictions responsible for paying compliance costs.

If project costs were estimated for some prior year, these costs should be adjusted upward to reflect current year prices using the average annual national Consumer

Price Index (CPI) inflation rate for the period. The CPI inflation rate is available from the Bureau of Labor Statistics. An additional source reporting the CPI inflation rate is the *CPI Detailed Report*, which is published monthly by the U.S. Department of Labor, Bureau of Labor Statistics.

In calculating the total annual cost of pollution control per household, current costs of pollution control must be considered along with the projected annual costs of the proposed pollution control project. The existing cost per household usually can be obtained from the most recent municipal records. For example, use the most recent operating revenues of the sewer enterprise fund, divided by the number of households served. If the portion of proposed project costs that households are expected to pay is known or is expected to remain unchanged, then use **Worksheet Q** to calculate the total annual cost of pollution control per household. If the portion paid by households is based on flow, then should refer to **Worksheet Q: Option A** as well.

#### **5.1.c Private-Sector Entities: Calculate the Annual Costs of the Pollution Control Project**

As with public-sector investments, the total capital costs are usually spread out over several years. Annualization calculates the amount that will be paid each year, including the financing costs. In order to allow for comparisons across cases, the analysis should assume that the applicant will borrow the capital and repay the loan in even annual installments over a 10 year period. The assumption of ten years is based on the likely life of the equipment. The assumption of even annual installments is made for convenience. The interest rate on the loan should be equivalent to the rate the applicant pays when it borrows money.

The financial tests discussed below compare the costs of compliance to other costs and revenues of the applicant. Compliance costs and other costs and revenues must, therefore, be calculated for the same year. See discussion

in Section 2.2, and Appendix A for references to inflation/deflation indices. The Annualized Cost of Pollution Control for a private-sector entity can be calculated using **Worksheet R**.



## Worksheet P

### Public-Sector Pollution Control Calculation of Total Annualized Project Costs

#### A. Capital Costs

Capital Cost of Project	\$	
Other One-Time Costs of Project (Please List, if any):		
_____	\$	
_____	\$	
_____	\$	
<b>Total Capital Costs (Sum column)</b>	<b>\$</b>	<b>(1)</b>
Portion of Capital Costs to be Paid for with Grant Monies	\$	(2)
Capital Costs to be Financed [Calculate: (1) - (2) ]	\$	(3)
Type of financing (e.g., G.O. bond, revenue bond, bank loan)		
Interest Rate for Financing (expressed as decimal)		(i)
Time Period of Financing (in years)		(n)
Annualization Factor = $\frac{i}{(1+i)^n - 1} + i$ (or see Appendix B)		(4)
<b>Annualized Capital Cost [Calculate: (3) x (4) ]</b>		<b>(5)</b>

#### B. Operating and Maintenance Costs

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)

_____	\$	
_____	\$	
_____	\$	
_____	\$	
<b>Total Annual O &amp; M Costs (Sum column)</b>	<b>\$</b>	<b>(6)</b>

#### C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [ (5) + (6) ]	\$	<b>(7)</b>
--	----	------------

## Worksheet Q

### Calculation of Total Annual Pollution Control Costs Per Household

#### A. Current Pollution Control Costs:

Total Annual Cost of Existing Pollution Control	\$	(1)
Amount of Existing Costs Paid By Households	\$	(2)
Percent of Existing Costs Paid By Households		%(3)
Number of Households*		(4)
Annual Cost Per Household [Calculate: (2)/(4) ]	\$	(5)

\* Do not use number of hook-ups.

#### B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

a) Yes [fill in percent from (3) ]

 percent.(6a)

b) No, they are expected to pay

 percent.(6b)

c) No, they are expected to pay based on flow. (Continue on Worksheet Q, Option A)

Total Annual Cost of Pollution Control Project [Line (7), Worksheet P]	\$	(7)
Proportion of Costs Households Are Expected to Pay [ (6a) or (6b) ]		(8)
Amount to Be Paid By Households [Calculate: (9) x (10) ]	\$	(9)
Annual Cost per Household [Calculate: (11)/(4) ]	\$	(10)

#### C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10)  (11)



## Worksheet R

### Private-Sector Development Calculation of Total Annualized Project Costs

Capital Costs to be financed (Supplied by applicant)	\$ _____	(1)
Interest Rate for Financing (Expressed as a decimal)	_____	(i)
Time Period of Financing (Assume 10 years*)	_____	10 years (n)
Annualization Factor** = $\frac{i}{(1+i)^{10} - 1} + i$	_____	(2)
Annualized Capital Cost [Calculate: (1) x (2) ]	\$ _____	(3)
Annual Cost of Operation and Maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)***	\$ _____	(4)
<b>Total Annual Cost of Pollution Control Project [ (3) + (4) ]</b>	<b>\$ _____</b>	<b>(5)</b>

\* While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

\*\* Or see Appendix B for calculated annualization factors

\*\*\* For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

## **5.2 Financial Analysis to Determine if Lower Water Quality is "Necessary"**

The purpose of the financial impact analysis is to assess the extent to which planned development will be reduced as a result of maintaining water quality. There are two sets of tests presented in this section: one set for publicly owned developments, such as POTWs, and another for privately owned developments, such as new manufacturing facilities. The tests are not designed to determine the exact impact of pollution control costs on an entity. They merely provide indicators of whether pollution control costs would result in a substantial impact.

### **5.2.a Public-Sector Developments: Calculate and Evaluate the Municipal Preliminary Screener Value**

Whether or not maintaining high-quality water is likely to interfere with a development due to additional public-sector costs is determined by jointly considering the results of two tests. The first test is a "screener" to establish whether the community can clearly pay for the project. The Municipal Preliminary Screener estimates the total per household annual pollution control costs to be borne by households (existing costs plus those attributable to the proposed project) as a percentage of median household income. The screener is written as follows:

$$\text{Municipal Preliminary Screener} = \frac{\text{Average Total Pollution Control Cost per Household}}{\text{Median Household Income}}$$

Median household income information for many municipalities is available from the 1990 Census of Population. To estimate median household income for the current year, use the CPI inflation rate for the period between the year that median household income is available and the current year.

## Worksheet S

### Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income}^*} \times 100$$

#### A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or Worksheet C, Option A (10) ]	\$	(1)
Median Household Income*	\$	(2)
<b>Municipal Preliminary Screener</b> (Calculate: [(1)/(2)] x 100)		<b>%(3)</b>

#### B. Evaluation of The Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

<b>Little Impact</b> Less than 1.0%	<b>Mid-Range Impact</b> 1.0% - 2.0%	<b>Large Impact</b> Greater than 2.0%
Indication of no substantial economic impacts	→ Proceed to Secondary Test	

\* 1990 Census adjusted by CPI inflation rate if necessary.

Depending on the results of the screener, the community is expected to incur small, mid-range, or large economic impacts (see **Worksheet S**). If the total annual cost per household (existing annual cost per household plus the incremental cost related to the proposed project) is less than 1.0 percent of median household income, then the requirements are not expected to impose a substantial economic hardship on households and would not interfere with the development.

Communities are expected to incur mid-range impacts when the ratio of total annual compliance costs to median household income is between 1.0 and 2.0 percent. If the average annual cost per household exceeds 2.0 percent of median household income, then the project may place a large financial burden on many of the households within the community and the requirements may interfere with the development. In either case, communities move on to the Secondary Test to demonstrate substantial impacts.

#### **5.2.b Public-Sector Developments: Secondary Test**

The Secondary Test is designed to build upon the characterization of community identified in the Municipal Preliminary Screener. The Secondary Test indicates the community's ability to obtain financing and describes the socioeconomic health of the community. Indicators describe precompliance debt, socioeconomic, and financial management conditions in the community. Using these indicators and the scoring system described below, the impact of the cost of pollution control is estimated. Specifically, applicants are required to present the following six indicators for the community:

##### **Debt Indicators**

- **Bond Rating (if available) - a measure of credit worthiness of the community;**
- **Overall Net Debt as a Percent of Full Market Value of Taxable Property - a measure of debt burden on residents within the community;**

### **Socioeconomic Indicators**

- **Unemployment Rate** - a measure of the general economic health of the community;
- **Median Household Income** - a measure of the wealth of the community;

### **Financial Management Indicators**

- **Property Tax Revenue as a Percent of Full Market Value of Taxable Property** - a measure of the funding capacity available to support debt based on the wealth of the community; and
- **Property Tax Collection Rate** - a measure of how well the local government is administered.

A more detailed description of the six indicators is presented in Section 2.4, including a discussion of alternative measures to use in States with property tax caps and limitations on assessed values. **Worksheet T** can be used to estimate each of the indicators. **Table 5-1** summarizes the indicators and what is considered to be a strong, mid-range, or weak rating.

The **Secondary Score** is calculated for the community by weighting each indicator equally and assigning a value of 1 to each indicator judged to be weak, a 2 to each indicator judged to be mid-range, and a 3 to each strong indicator. A cumulative assessment score is arrived at by summing the individual scores and dividing by the number of factors used. **Worksheet U** guides the reader through this calculation. The cumulative assessment score is evaluated as follows:

- less than 1.5 is considered weak
- between 1.5 and 2.5 is considered mid-range
- greater than 2.5 is considered strong

## Worksheet T

### Data Used in the Secondary Test

Please list the following values used in determining the Secondary Score. Potential sources of the data are indicated.

#### A. Data Collection

Data	Potential Source	Value
Direct Net Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (1)
Overlapping Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (2)
Market Value of Property	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (3)
Bond Rating	Standard and Poors or Moody's	_____ (4)
Community Unemployment Rate	1990 Census of Population Regional Data Centers	_____ % (5)
National Unemployment Rate	Bureau of Labor Statistics (202) 606-6392	_____ % (6)
Community Median Household Income	1990 Census of Population	\$ _____ (7)
State Median Household Income	1990 Census of Population	\$ _____ (8)
Property Tax Collection Rate	Community Financial Statements Town, County or State Assessor's Office	_____ % (9)
Property Tax Revenues	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (10)

## Worksheet T, Continued

### B. Calculation of Indicators

#### 1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) + (2) )

\$ \_\_\_\_\_ (11)

Overall Net Debt as a Percent of Full Market Value of Taxable Property (Calculate: [(11)/(3)] x 100)

\_\_\_\_\_ (12)

#### 2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a Percent of Full Market Value of Taxable Property (Calculate: [(10)/(3)] x 100)

\_\_\_\_\_ (13)

## Worksheet U

### Calculating The Secondary Score

Please check the appropriate box in each row, and record the corresponding score in the final column. Then, sum the scores and compute the average. Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators.

Indicator	Secondary Indicators			Score
	Weak*	Mid-Range**	Strong***	
Bond Rating Worksheet T, (4)	Below BBB (S&P) Below Baa (Moody's) <input type="checkbox"/>	BBB (S&P) Baa (Moody's) <input type="checkbox"/>	Above BBB (S&P) or Baa (Moody's) <input type="checkbox"/>	
Overall Net Debt as Percent of Full Market Value of Taxable Property Worksheet T, (12)	Above 5% <input type="checkbox"/>	2%-5% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Unemployment Worksheet T, (5)& (6)	Above National Average <input type="checkbox"/>	National Average <input type="checkbox"/>	Below National Average <input type="checkbox"/>	
Median Household Income Worksheet T, (7) & (8)	Below State Median <input type="checkbox"/>	State Median <input type="checkbox"/>	Above State Median <input type="checkbox"/>	
Property Tax Revenues as a Percent of Full Market Value of Taxable Property Worksheet T, (13)	Above 4% <input type="checkbox"/>	2%-4% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Property Tax Collection Rate Worksheet T, (9)	< 94% <input type="checkbox"/>	94% - 98% <input type="checkbox"/>	> 98% <input type="checkbox"/>	

\* Weak is a score of 1 point

SUM

\*\* Mid-Range is a score of 2 points

\*\*\* Strong is a score of 3 points

AVERAGE

**TABLE 5-1**  
**SECONDARY INDICATORS**

<b>Indicator</b>	<b>Secondary Indicators</b>		
	<b>Weak</b>	<b>Mid-Range</b>	<b>Strong</b>
<b>Bond Rating</b>	Below BBB (S&P) Below Baa (Moody's)	BBB (S&P) Baa (Moody's)	Above BBB (S&P) or Baa (Moody's)
<b>Overall Net Debt as Percent of Full Market Value of Taxable Property</b>	Above 5%	2%-5%	Below 2%
<b>Unemployment</b>	More than 1% above National Average	National Average	More than 1% below National Average
<b>Median Household Income</b>	More than 10% below State Median	State Median	More than 10% above State Median
<b>Property Tax Revenues as a Percent of Full Market Value of Taxable Property</b>	Above 4%	2%-4%	Below 2%
<b>Property Tax Collection Rate</b>	< 94%	94% - 98%	> 98%

If the applicant is not able to develop one or more of the six indicators, they must provide an explanation as to why the indicator is not appropriate or not available. Since the point of the analysis is to measure the overall burden to the community, the debt and socioeconomic indicators are assumed to be better measures of burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the applicant should average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

#### **5.2.d Public-Sector Developments: Assess Whether the Requirements Would Interfere With the Development**

The results of the two tests are considered jointly in determining whether the community is expected to incur substantial impacts that would interfere with the development. As shown in Table 5-2, the cumulative assessment score for the community is combined with the estimated household burden. The combination of factors establishes whether impacts can be expected to be substantial.

In the matrix, "X" indicates that the impact is likely to interfere with the development. The closer the community is to the upper right hand corner of the matrix, the greater the likelihood. Similarly, "✓" indicates that the impact is not likely to interfere with development. The closer to the lower left hand corner of the matrix, the smaller the likelihood. Finally, the "?" indicates that the impact is unclear.

**TABLE 5-2**

**ASSESSMENT OF SUBSTANTIAL IMPACTS MATRIX**

Secondary Score	Municipal Preliminary Screener		
	Less than 1.0 Percent	Between 1.0 and 2.0 Percent	Greater than 2.0 Percent
Less than 1.5	?	X	X
Between 1.5 and 2.5	✓	?	X
Greater than 2.5	✓	✓	?

**5.2.e Private-Sector Developments: Financial Measures**

Four general categories of financial tests are used to determine if maintaining high-quality water will interfere with privately owned development. The four categories are divided into a primary measure of financial impacts and three secondary measures of financial impacts:

**Primary Measure**

- Profit -- how much would profits decline due to pollution control expenditures?

**Secondary Measures**

- Liquidity -- how easily can an entity pay its short-term bills?
- Solvency -- how easily can an entity pay its fixed and long-term bills?
- Leverage -- how much money can the entity borrow?

Profit and solvency ratios are calculated both with and without the additional compliance costs (taking into consideration the entity's ability, if any, to increase its prices to cover part or all of the costs). Comparing these ratios to each other and to industry benchmarks provides a measure of the impact on the entity. Since antidegradation reviews involve new or expanded operations, the ratios

often will be calculated using estimated values from pro-forma income statements and balance sheets prepared for the development.

For all of the tests, it is important to look beyond the individual test results and evaluate the total situation of the entity. While each test addresses a single aspect of financial health, the results of the four tests should be considered jointly to obtain an overall picture. The results should be compared with the ratios for other entities in the same industry or activity.

The primary and secondary measures are described below, along with an example of specific tests to be used. While there are several ratios that could be used for each test, to simplify the presentation only one ratio per test is described. In most cases, interpreting the results requires comparisons with typical values for the industry. Among the sources that provide comparative information are: Robert Morris Associates' *Annual Statement Studies*, *Moody's Industrial Manual*, Dun and Bradstreet's *Dun's Industry Norms*, and Standard & Poor's *Industry Surveys*. The *Annual Statement Studies*, *Dun's Industry Norms*, and Standard & Poor's *Industry Surveys* provide composite statistics for firms grouped into various manufacturing and service industries. The *Moody's Industrial Manual* provides detailed financial information on individual firms that can be used for comparison purposes. Each of the tests is discussed in more detail in Chapter 3.

#### **5.2.f Private-Sector Developments: Primary Measure**

Primary measure is the Profit Test, which measures the development's earnings if it is required to provide pollution control necessary to maintain the high-quality waters and if it is not required to do so. If maintaining high-quality water would result in considerably lower profits, then the development might not take place.

Two pieces of information are needed for the Profit Test. The first piece is the total annual cost of the required pollution control from Worksheet R. The second piece is

the earnings information from the entity's income statement (Worksheet V).

$$\text{Profit Test} = \frac{\text{Earnings Before Taxes}}{\text{Revenues}}$$

The Profit Test should be calculated with and without the cost of the pollution control. In the former case, the annualized cost of pollution control (including O&M) is subtracted from the discharger's estimated earnings before taxes (revenues minus costs excluding income taxes). The Profit Test can be calculated using Worksheets V, and W. These profit rates should be compared to those for facilities in similar lines of business, using data in *Moody's Industrial Manual*, *Dun & Bradstreet's Industry Norms and Key Business Ratios*, *Standard & Poor's Industry Surveys*, or Robert Morris's *Annual Statement Studies*.

The degree to which the discharger is able to raise prices is difficult to predict, and depends on many factors. Considerations should include the level of competition in the industry, the likelihood of competitors' facilities facing similar project costs, and the willingness of consumers to pay more for the product.

#### **5.2.g Private-Sector Developments: Secondary Measures**

The following secondary measures provide additional important information about the financial health of the development. All primary and secondary measures should be included in the analysis.

##### **Liquidity**

Liquidity is a measure of how easily a discharger can pay its short-term bills. One measure of liquidity is the Current Ratio, which compares current assets with current liabilities. Current assets include cash and other assets that are or could reasonably be converted into cash during the current year. Likewise, current liabilities are items that must be paid within the current year.

Worksheet V

Calculation of Earnings Before Taxes

**A. Earnings Without Pollution Control Project Costs**

$$\text{EBT} = \text{R} - \text{CGS} - \text{CO}$$

**B. Earnings With Pollution Control Project Costs**

$$\text{EWPR} = \text{EBT} - \text{ACPR}$$

Where: EBT = Earnings Before Taxes  
EWPR = Earnings with Pollution Project Costs  
R = Revenues  
CGS = Cost of Goods Sold (including the cost of materials, direct labor, indirect labor, rent and heat)  
CO = Portion of Corporate Overhead Assigned to the Discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)  
ACPR = Total Annual Costs of Pollution Control Project [Worksheet R (5)]

R	\$ _____	(1)
CGS	\$ _____	(2)
CO	\$ _____	(3)
<b>EBT [ (1) - (2) - (3) ]</b>	<b>\$</b> <input type="text"/>	<b>(4)</b>
ACPR [ Worksheet R (5) ]	\$ _____	(5)
<b>EWPR [ (4) - (5) ]</b>	<b>\$</b> <input type="text"/>	<b>(6)</b>

## Worksheet W

### Calculation of Profit Rates

#### A. Profit Rate Without Project Costs

$$\text{PRT} = \text{EBT} \div \text{R}$$

#### B. Profit Rate With Pollution Control Costs

$$\text{PRPR} = \text{EWPR} \div \text{R}$$

Where:      PRT =      Profit Rate Before Taxes  
              PRPR =     Profit Rate with Pollution Control Costs  
              EBT =      Earnings Before Taxes  
              EWPR =     Before-Tax Earnings with Pollution Control Costs  
              R =         Revenues

EBT [Worksheet V, (4)] \_\_\_\_\_ (1)

R [Worksheet V, (1)] \_\_\_\_\_ (2)

**PRT = Calculate: [(1)/(2)]**  (3)

EWPR [Worksheet V, (6)] \$ \_\_\_\_\_ (4)

R [Worksheet V, (1)] \$ \_\_\_\_\_ (5)

**PRPR [Calculate: (4)/(5)]**  (6)

The Current Ratio is calculated by dividing current assets by current liabilities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The Current Ratio can be calculated using **Worksheet X**. The general rule is that if the Current Ratio is greater than 2, the entity should be able to cover its short-term obligations. Frequently, lenders require this level of liquidity as a prerequisite for lending. This rule (Current Ratio > 2) may not, however, be appropriate for all types of private entities. The Current Ratio of the discharger in question should be compared with ratios for other dischargers in the same line of business.

### **Solvency**

Solvency is a measure of an entity's ability to meet its fixed and long-term obligations. These obligations are bills and debts that are owed on a regular basis for periods longer than one year. Solvency tests are commonly used to predict financial problems that could lead to bankruptcy within the next few years.

As with liquidity, there are several possible tests for solvency. One solvency test, the Beaver's Ratio, compares cash flow to total debt. This test has been shown to be a good indicator of the likelihood of bankruptcy.

$$\text{Beaver's Ratio} = \frac{\text{Cash Flow}}{\text{Total Debt}}$$

The Beaver's Ratio can be calculated using **Worksheet Y**. Cash Flow is a measure of the cash the entity has available to it in a given year. Since depreciation is an accounting cost -- a cost that does not use any currently available revenues -- it is added back to reported net

## Worksheet X

### Calculation of The Current Ratio

$$CR = CA \div CL$$

- Where:
- CR = Current Ratio
  - CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)
  - CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

CA	\$	_____	(1)
CL	\$	_____	(2)
CR [Calculate: (1)/(2)]		<input type="text"/>	(3)

income after taxes to get cash flow. Total debt is equal to the current debt for the current year plus the long term debt, since current debt includes that part of long-term debt that is due in the current year.

If the Beaver's Ratio is greater than 0.20 the development is considered to be solvent (i.e., can pay its long-term debts). If the ratio is less than 0.15 the development may be insolvent (i.e., go bankrupt). If the ratio is between 0.15 and 0.20, then future solvency is uncertain.

### Leverage

Leverage tests measure the extent to which a firm has fixed financial obligations and thus indicates how much more money a firm is capable of borrowing. Firms that rely heavily on debt may find it difficult and expensive to borrow additional funds. One commonly used measure of leverage is the Debt to Equity Ratio.

$$\text{Debt/Equity Ratio} = \frac{\text{Long-Term Liabilities}}{\text{Owners' Equity}}$$

The Debt to Equity Ratio can be calculated using Worksheet Z. Since there are no generally accepted Debt/Equity Ratio values that apply to all types of economic activity, the ratio should be compared with the ratio of firms in similar businesses. If the entity's ratio compares favorably with the median or upper quartile ratio for similar businesses, it should be able to borrow additional funds. These ratios can be calculated using data in Robert Morris Associates' *Annual Statement Studies*, *Moody's Industrial Manual*, and Dun & Bradstreet's *Dun's Industry Norms*.

For entities with special sources of funding, leverage is not an appropriate measure of their ability to raise capital. Examples are agriculture and affordable housing, where special loan programs may be available. In these cases, an

## Worksheet Y

### Calculation of Beaver's Ratio

$$BR = CF \div TD$$

Where: BR = Beaver's Ratio  
CF = Cash Flow  
TD = Total Debt

#### Cash Flow:

Net Income After Taxes	\$	(1)
Depreciation	\$	(2)
CF [Calculate: (1) + (2)]	\$	(3)

#### Total Debt:

Current Debt	\$	(4)
Long-Term Debt	\$	(5)
Total Debt	\$	(6)

#### Beaver's Ratio:

BR [(3) / (6)]	<input type="text"/>	(7)
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## Worksheet Z

### Debt to Equity Ratio

$$\text{DER} = \text{LTL} \div \text{OE}$$

Where: DER = Debt/Equity Ratio  
LTL = Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)  
OE = Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

LTL	\$ _____	(1)
OE	\$ _____	(2)
DER [(1)/(2)]	<input type="text"/>	(3)

analysis of the probability that the project would receive this money is appropriate.

**5.2.g Private-Sector Developments: Assess Whether the Requirements Will Interfere With the Development: Interpreting the Results**

The financial analysis should be used to determine if there will be a substantial adverse impact such as to interfere with the development. If the four tests taken together indicate that the requirements would interfere with the development, then proceed to Section 5.3 to determine if the development would be considered important in social and economic terms.

**5.3 Determine If Economic and Social Development Would Be Important**

There are no economic ratios per se that determine whether a development would be considered important. Instead, the relative magnitudes of indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees should be taken into account. The term important is intended to convey a general concept regarding the level of social and economic development used to justify a change in high-quality waters.

**5.3.a Define Relevant Geographical Area**

One important factor is defining the geographical area in which the impacts will occur. In the case of municipal pollution control projects, the affected community is most often the immediate municipality. The relevant geographic area for evaluating the importance of a private-sector development varies with each situation. The area will typically be determined by the area in which the majority of its workers live and where most of the businesses that depend on it are located. In either case, the geographical area considered must include "...the area in which the waters are located." (40 CFR 131.12 (a)(2)) There are no

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simple rules for defining the relevant area or community; the decision is based on the judgement of the applicant and state, subject to EPA review.

**5.3.b Public-Sector Developments: Determine Whether Important**

While there are no explicit criteria, it is recommended that changes in the socioeconomic indicators listed below be considered. For each indicator listed, the applicant should estimate the potential change that would result from the development.

- Median Household Income;
- Community Unemployment Rate;
- Overall Net Debt as a Percent of Full Market Value of Taxable Property;
- Percent of Households Below Poverty Line;
- Impact on Community Development Potential; and
- Impact on Property Values.

Estimated changes should be provided, along with supporting discussions, on **Worksheet AA**.

**5.3.c Private-Sector Developments: Determine Whether Important**

Determination of whether or not a private-sector development will be important to a community requires exploring more factors than is the case with public-sector developments. **Worksheet AB** has been provided to assist applicants in their evaluation of socioeconomic impacts. It is designed as a list of the factors applicants should consider in determining whether the development is important. Applicants should feel free, however, to add anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.

Potentially, one of the most important impacts on the affected community's economy is the employment to be gained. The size of this impact is dependent on the

number of new jobs relative to the total number of jobs in the community, and to the other job opportunities available in the community. Typically, an increase in employment leads to an increase in personal income in the affected community. The total amount of income gained by the affected community will depend, in part, on the other job prospects of those hired. To assess the net impact on employment in the affected community, the existing rate of unemployment should be considered as an indicator of worker mobility between jobs.

The analysis should also consider whether the increase in employment opportunities may lead to a decreased need for social services in the affected community. If the cost of savings for decreased social services will be borne by the affected community, they should be included in the assessment.

The effects of increased employment and personal income will be compounded as the money moves through the economy. This multiplier effect means that each dollar gained to an employee results in the gain of more than a dollar to the local economy. Multiplier effects are discussed in more detail in Section 4.4.

Socioeconomic impacts may also include effects on the local government(s) such as property tax revenues and the demand for other public services. For example, if the development would be paying a share of the cost to upgrade a municipal treatment plant, then the analysis of community impacts is more complicated. If the development is eliminated, the system may become excessively expensive for the remaining users.

#### **5.4 Summary**

Using the guidance described in this document, the applicant must demonstrate that the pollution control measures needed to maintain the high-quality waters will interfere with the development. In addition, the applicant will have to show that the development is important to the community.

The tests used to demonstrate interference and importance are the same as those used to demonstrate substantial and widespread. The difference is, however, that an antidegradation review considers situations that would improve the economic condition.

**Worksheet AA**

**Public-Sector Development  
Qualitative Description of Estimated Change  
in Socioeconomic Indicators  
due to Pollution Control Costs**

Estimated change  
in Median  
Household  
Income (MHI)

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Estimated change  
in the  
unemployment  
rate

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Estimated change  
in overall net debt  
as a percent of  
full market value  
of taxable  
property

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Estimated change  
in % of  
households below  
the poverty line

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Impact on  
commercial  
development  
potential

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Impact on  
Property Values

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**Worksheet AB**

**Private-Sector Development  
Factors to Consider in Making a Determination of Widespread Social and Economic Impacts**

- Define the affected community in this case; what areas are included. \_\_\_\_\_ (1)
- Current unemployment rate in affected community (if available). \_\_\_\_\_ (2)
- Current national unemployment rate. \_\_\_\_\_ (3)
- Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards. \_\_\_\_\_ (4)
- Expected unemployment rate in the affected community after compliance with water quality standards (Current # of persons collecting unemployment in affected community + (4)/labor force in affected community). \_\_\_\_\_ (5)
- Median household income in affected community. \_\_\_\_\_ (6)
- Total number of households in affected community. \_\_\_\_\_ (7)
- Percent of population below the poverty line in affected community. \_\_\_\_\_ (8)
- Current expenditures on social services in affected community. \_\_\_\_\_ (9)
- Expected expenditures on social services due to job losses in the affected community. \_\_\_\_\_ (10)
- Current total tax revenues in the affected community. \_\_\_\_\_ (11)
- Tax revenues paid by the private entity to the affected community. \_\_\_\_\_ (12)

**Worksheet AB, continued**

Tax revenues paid by the private entity as a percentage of the affected community's total tax revenues.*	_____	(13)
Current statewide unemployment rates.	_____	(14)
Additional number of persons expected to collect unemployment in the State due to compliance with water quality standards.	_____	(15)
Expected statewide unemployment rate, after compliance with water quality standards (Current # of persons collecting unemployment in State + (15)/labor force in State.	_____	(16)
Current expenditures on social services in State.	_____	(17)
Expected statewide expenditures on social services due to job losses.	_____	(18)

\* In some cases, the affected community will include more than just the municipality in which the private entity is located. If so, the analysis should consider the private entity's tax revenues as a percentage of the tax revenues for only the municipality in which the entity is located.

**APPENDIX A**

**DATA RESOURCES AND REFERENCE  
MATERIALS**

## APPENDIX A

### Cost Estimation Resources:

U.S. EPA, *Construction Costs for Municipal Wastewater Treatment Plants: 1973-1978*, EPA/430/9-80-003, April, 1980.

U.S. EPA, *Technical Report: Operation and Maintenance Costs for Municipal Wastewater Facilities*, EPA/430/9-81-004, September, 1981.

U.S. EPA, *Construction Costs for Municipal Wastewater Conveyance Systems: 1973-1979*, EPA/430/9-81-003, January, 1981.

U.S. EPA, *Quarterly Indices of Direct Costs for Operation, Maintenance and Repair: (a) Waste Pumping Stations, (b) Gravity Sewers*, Office of Municipal Pollution Control, Municipal Facilities Division, Current.

### Municipal Statistics Resources:

Bureau of the Census, U.S. Department of Commerce, *County and City Data Book*, published annually.

### Financial and Ratio Analysis Resources:

Leopold A. Bernstein, *The Analysis of Financial Statements*, Dow Jones-Irwin, 1978.

Dun & Bradstreet, *Dun's Industry Norms*, annual.

J. Fred Weston and Eugene F. Brigham, *Managerial Finance*, The Dryden Press, several editions.

Robert Morris Associates, *Annual Statement Studies*, annual.

Moody's Financial Services, *Moody's Industrial Manual*, annual.

U.S. Department of Labor, Bureau of Labor Statistics, *CPI Detailed Report*.

U.S. EPA, *EPA Financial Capability Guidebook*, Office of Water Programs Operations, 1984.

U.S. EPA, *The Municipal Sector Study: Impacts of Environmental Regulations on Municipalities*, EPA 230-09-038, Office of Policy, Planning and Evaluation, September 1988.

## **APPENDIX B**

### **TABLE OF ANNUALIZATION FACTORS**

Apj Jix B. Table of Annualization Factors

Year	Interest Rate											
	0.005	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06
1	1.0050	1.0100	1.0150	1.0200	1.0250	1.0300	1.0350	1.0400	1.0450	1.0500	1.0550	1.0600
2	0.5038	0.5075	0.5113	0.5150	0.5188	0.5226	0.5264	0.5302	0.5340	0.5378	0.5416	0.5454
3	0.3367	0.3400	0.3434	0.3468	0.3501	0.3535	0.3569	0.3603	0.3638	0.3672	0.3707	0.3741
4	0.2531	0.2563	0.2594	0.2626	0.2658	0.2690	0.2723	0.2755	0.2787	0.2820	0.2853	0.2886
5	0.2030	0.2060	0.2091	0.2122	0.2152	0.2184	0.2215	0.2246	0.2278	0.2310	0.2342	0.2374
6	0.1696	0.1725	0.1755	0.1785	0.1815	0.1846	0.1877	0.1908	0.1939	0.1970	0.2002	0.2034
7	0.1457	0.1486	0.1516	0.1545	0.1575	0.1605	0.1635	0.1666	0.1697	0.1728	0.1760	0.1791
8	0.1278	0.1307	0.1336	0.1365	0.1395	0.1425	0.1455	0.1485	0.1516	0.1547	0.1579	0.1610
9	0.1139	0.1167	0.1196	0.1225	0.1255	0.1284	0.1314	0.1345	0.1376	0.1407	0.1438	0.1470
10	0.1028	0.1056	0.1084	0.1113	0.1143	0.1172	0.1202	0.1233	0.1264	0.1295	0.1327	0.1359
11	0.0937	0.0965	0.0993	0.1022	0.1051	0.1081	0.1111	0.1141	0.1172	0.1204	0.1236	0.1268
12	0.0861	0.0888	0.0917	0.0946	0.0975	0.1005	0.1035	0.1066	0.1097	0.1128	0.1160	0.1193
13	0.0796	0.0824	0.0852	0.0881	0.0910	0.0940	0.0971	0.1001	0.1033	0.1065	0.1097	0.1130
14	0.0741	0.0769	0.0797	0.0826	0.0855	0.0885	0.0916	0.0947	0.0978	0.1010	0.1043	0.1076
15	0.0694	0.0721	0.0749	0.0778	0.0808	0.0838	0.0868	0.0899	0.0931	0.0963	0.0996	0.1030
16	0.0652	0.0679	0.0708	0.0737	0.0766	0.0796	0.0827	0.0858	0.0890	0.0923	0.0956	0.0990
17	0.0615	0.0643	0.0671	0.0700	0.0729	0.0760	0.0790	0.0822	0.0854	0.0887	0.0920	0.0954
18	0.0582	0.0610	0.0638	0.0667	0.0697	0.0727	0.0758	0.0790	0.0822	0.0855	0.0889	0.0924
19	0.0553	0.0581	0.0609	0.0638	0.0668	0.0698	0.0729	0.0761	0.0794	0.0827	0.0862	0.0896
20	0.0527	0.0554	0.0582	0.0612	0.0641	0.0672	0.0704	0.0736	0.0769	0.0802	0.0837	0.0872

## Appendix B. Table of Annualization Factors

Year	Interest Rate											
	0.065	0.07	0.075	0.08	0.085	0.09	0.095	0.1	0.105	0.11	0.115	0.12
1	1.0650	1.0700	1.0750	1.0800	1.0850	1.0900	1.0950	1.1000	1.1050	1.1100	1.1150	1.1200
2	0.5493	0.5531	0.5569	0.5608	0.5646	0.5685	0.5723	0.5762	0.5801	0.5839	0.5878	0.5917
3	0.3776	0.3811	0.3845	0.3880	0.3915	0.3951	0.3986	0.4021	0.4057	0.4092	0.4128	0.4163
4	0.2919	0.2952	0.2986	0.3019	0.3053	0.3087	0.3121	0.3155	0.3189	0.3223	0.3258	0.3292
5	0.2406	0.2439	0.2472	0.2505	0.2538	0.2571	0.2604	0.2638	0.2672	0.2706	0.2740	0.2774
6	0.2066	0.2098	0.2130	0.2163	0.2196	0.2229	0.2263	0.2296	0.2330	0.2364	0.2398	0.2432
7	0.1823	0.1856	0.1888	0.1921	0.1954	0.1987	0.2020	0.2054	0.2088	0.2122	0.2157	0.2191
8	0.1642	0.1675	0.1707	0.1740	0.1773	0.1807	0.1840	0.1874	0.1909	0.1943	0.1978	0.2013
9	0.1502	0.1535	0.1568	0.1601	0.1634	0.1668	0.1702	0.1736	0.1771	0.1806	0.1841	0.1877
10	0.1391	0.1424	0.1457	0.1490	0.1524	0.1558	0.1593	0.1627	0.1663	0.1698	0.1734	0.1770
11	0.1301	0.1334	0.1367	0.1401	0.1435	0.1469	0.1504	0.1540	0.1575	0.1611	0.1648	0.1684
12	0.1226	0.1259	0.1293	0.1327	0.1362	0.1397	0.1432	0.1468	0.1504	0.1540	0.1577	0.1614
13	0.1163	0.1197	0.1231	0.1265	0.1300	0.1336	0.1372	0.1408	0.1444	0.1482	0.1519	0.1557
14	0.1109	0.1143	0.1178	0.1213	0.1248	0.1284	0.1321	0.1357	0.1395	0.1432	0.1470	0.1509
15	0.1064	0.1098	0.1133	0.1168	0.1204	0.1241	0.1277	0.1315	0.1352	0.1391	0.1429	0.1468
16	0.1024	0.1059	0.1094	0.1130	0.1166	0.1203	0.1240	0.1278	0.1316	0.1355	0.1394	0.1434
17	0.0989	0.1024	0.1060	0.1096	0.1133	0.1170	0.1208	0.1247	0.1285	0.1325	0.1364	0.1405
18	0.0959	0.0994	0.1030	0.1067	0.1104	0.1142	0.1180	0.1219	0.1259	0.1298	0.1339	0.1379
19	0.0932	0.0968	0.1004	0.1041	0.1079	0.1117	0.1156	0.1195	0.1235	0.1276	0.1316	0.1358
20	0.0908	0.0944	0.0981	0.1019	0.1057	0.1095	0.1135	0.1175	0.1215	0.1256	0.1297	0.1339

## **APPENDIX C**

# **CONCEPTUAL MEASURES OF ECONOMIC BENEFITS**

## APPENDIX C

### CONCEPTUAL MEASURES OF ECONOMIC BENEFITS

In valuing benefits associated with an ecological resource such as clean water, a basic distinction is made between the intrinsic value of the existence of the resource and its value in use by the human population. Use values are further subdivided into direct or indirect uses. Other valuation concepts arise from the uncertainty surrounding future uses and availability of the resource. A classification of these valuation concepts, along with examples, is presented in Table C-1.

#### C.1 Use Benefits

Estimating the benefits of clean water will depend upon several variables that describe the attributes of the resource and its uses. A waterbody might be used for recreational activities (such as fishing, boating, swimming, hunting, bird watching), for commercial purposes (such as industrial water supply, irrigation, municipal drinking water, and fish harvesting), or for both. Where recreational activities are created or enhanced due to water quality improvements, the public will benefit in the form of increased recreational opportunities. Similarly, the cost of treating irrigation and drinking water to down stream users could be reduced if pollutant discharges were reduced or eliminated in a particular stretch of river.

Direct use includes both consumptive and non-consumptive uses. Consumptive uses can be distinguished from non-consumptive uses in that the former excludes other uses of the same resource while the latter does not. For example, water is consumed when it is diverted from a waterbody for irrigation purposes. With non-consumptive uses, however, the resource base remains in the same state before and after use (e.g., swimming). Human health benefits associated with cleaner water could

**TABLE C-1**  
**CATEGORIES OF BENEFITS**

**Use Benefits**

**Direct**

**Consumptive: *Market Benefits***

Industrial Water Supply  
Agricultural Water Supply  
Municipal Water Supply  
Commercial Fishing

***Non-Market Benefits***

Recreational Fishing  
Hunting  
Industrial Water Supply  
Agricultural Water Supply  
Municipal Water Supply

**Non-Consumptive: Swimming  
Boating  
Human Health**

**Indirect**

Fishing Equipment Manufacturer  
Property Values  
Aesthetics (scenic views, water enhanced recreation)

**Intrinsic Benefits**

Option Value (access to resource in future)

Existence Value (knowledge that services of resource exist)

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be consumptive (reduced illness from eating finfish or shellfish) or non-consumptive (reduced exposure to infectious diseases while recreating).

When estimating benefits, it is important to determine whether or not the resource and its uses (in this case clean water) can be considered market or non-market resources and uses (i.e., does a market exist for the resource or its use). For example, commercial fisheries have a market value reflected by the financial value of landings of a particular species. By contrast, no market exists to describe the value individuals receive from swimming. Where market values are available, they should be used to estimate benefits. In the case of water supply, there may or may not be a market for clean water. Some water users may be required to pay for that use as in the case of a farmer paying a regional water board to divert water for irrigation purposes. This will be particularly true in the arid west. By contrast, a manufacturing facility using water for cooling or process water may not pay anything for the right to pump and use water from an adjacent river. For resources with no market value, a number of estimation techniques including the travel cost, estimation from similar markets, and contingent valuation methods have been developed.

While they are conceptually distinct attributes, consumptive use is frequently associated with markets and non-consumptive use is frequently associated with non-market situations. Some resources that are considered market resources, however, may be used non-consumptively. The converse is also true. As an example of the first, a fee may be charged (other than parking) to gain entrance to a state park, however, while a swimmer's use of a lake in the park is not consuming any part of the lake.

Commercial activities that are dependent on clean water which is not directly owned are said to benefit from indirect use. Examples would be a fishing equipment manufacturer's dependence on healthy fish stocks to induce demand for its products or the dependence of property

values on the pristine condition of an adjacent water body. Indirect use is also characterized by the scenic views and water enhanced recreational opportunities (camping, picnicking, birdwatching) associated with the quality of water in a water body. Indirect use benefits such as enhanced property values can be estimated using the hedonic price technique. Care should be taken, however, to not double-count benefits. If property values reflect the proximity to and thus use of water, then the value of the use should not be included separately.

## **C.2 Intrinsic Benefits**

Intrinsic benefits include all benefits associated with a resource that are not directly related to the current use of the resource. Intrinsic benefits are represented by the sum of existence and option values. Existence value indicates an individual's (and society's) willingness to pay to maintain an ecological resource such as clean water for its own sake, regardless of any perceived or potential opportunity for that individual to use the water body now or in the future. Contributions of money to save endangered species such as the snail darter demonstrate a willingness to pay for the existence of an environmental amenity despite the fact that the contributors may never use it or even experience it directly.

Option value is the willingness to pay for having a future opportunity to use resources such as clean water in known or as yet unknown ways. In a sense it is a combination of insurance and speculative value. Individuals routinely pay to store or transport something they are not sure they will use in the future because they recognize it would be more costly to recreate the item than to preserve it. In an ecological sense, pristine habitats and wildlife refuges are often preserved under the assumption that plant or animal species which may yield pharmaceutical, genetic, or ecosystem benefits are yet to be discovered. Option value takes on particular importance when proposed development or environmental perturbations are largely irreversible or pollutants are persistent.

Intrinsic benefits are difficult to measure due to the level of uncertainty associated with these benefits. The most common approach to estimating intrinsic benefits, however, is the contingent valuation method, which cannot be described in detail within this short overview.

### **C.3 Summary**

Total valuation of clean water benefits includes all use and existence values as well as option value. The proper framework for estimating the economic benefits associated with clean water consists of 1) determining when damage first occurs or would occur; 2) identifying and quantifying the potential physical/biological damages relative to an appropriate baseline; 3) identifying all affected individuals both due to potential loss of direct or indirect services or uses, and to potential losses attributable to existence values (may include projections for growth in participation rates); 4) estimating the value affected individuals place on clean water prior to potential degradation; and 5) determining the time horizon over which the waterbody would be degraded or restored to some maximum reduced state of service (if ever), and appropriately discounting the stream of potential lost services. If evaluating an improvement in water quality, the procedures are the same except that benefits gained are measured.

# **WORKSHEETS**

**Worksheet A**

**Pollution Control Project Summary Information**

Current Capacity of the Pollution Control System	_____
Design Capacity of the Pollution Control System	_____
Current Excess Capacity	_____ %
Expected Excess Capacity after Completion of Project	_____ %
Projected Groundbreaking Date	_____
Projected Date of Completion	_____

Please describe the pollution control project being proposed below. (Attach additional page if necessary).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please describe the other pollution control options considered, explaining why each option was rejected. (Attach additional page if necessary).

\_\_\_\_\_  
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## Worksheet B

### Calculation of Total Annualized Project Costs

#### A. Capital Costs

Capital Cost of Project \$ \_\_\_\_\_

Other One-Time Costs of Project (Please List, if any):

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

**Total Capital Costs (Sum column)** **\$ (1)**

Portion of Capital Costs to be Paid for with Grant Monies \$ (2)

Capital Costs to be Financed [Calculate: (1) - (2) ] \$ (3)

Type of financing (e.g., G.O. bond, revenue bond, bank loan) \_\_\_\_\_

Interest Rate for Financing (expressed as decimal) (i)

Time Period of Financing (in years) (n)

Annualization Factor =  $\frac{i}{(1+i)^n - 1} + i$  (or see Appendix B) (4)

**Annualized Capital Cost [Calculate: (3) x (4) ]** **(5)**

#### B. Operating and Maintenance Costs

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

\_\_\_\_\_ \$ \_\_\_\_\_

**Total Annual O & M Costs (Sum column)** **\$ (6)**

#### C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [ (5) + (6) ] **\$ (7)**

## Worksheet C

### Calculation of Total Annual Pollution Control Costs Per Household

#### A. Current Pollution Control Costs:

Total Annual Cost of Existing Pollution Control	\$	(1)
Amount of Existing Costs Paid By Households	\$	(2)
Percent of Existing Costs Paid By Households		%(3)
Number of Households*		(4)
Annual Cost Per Household [Calculate: (2)/(4) ]	\$	(5)

\* Do not use number of hook-ups.

#### B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

- a) Yes [fill in percent from (3) ]  percent.(6a)
- b) No, they are expected to pay  percent.(6b)
- c) No, they are expected to pay based on flow. (Continue on Worksheet C, Option A)

Total Annual Cost of Pollution Control Project [Line (7), Worksheet B]	\$	(7)
Proportion of Costs Households Are Expected to Pay [ (6a) or (6b) ]		(8)
Amount to Be Paid By Households [Calculate: (7) x (8) ]	\$	(9)
Annual Cost per Household [Calculate: (9)/(4) ]	\$	(10)

#### C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10)  (11)



## Worksheet D

### Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income}^*} \times 100$$

#### A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or Worksheet C, Option A (10) ]	\$	(1)
Median Household Income*	\$	(2)
<b>Municipal Preliminary Screener</b> (Calculate: [(1)/(2)] x 100)		<b>%(3)</b>

#### B. Evaluation of The Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

<b>Little Impact</b> Less than 1.0%	<b>Mid-Range Impact</b> 1.0% - 2.0%	<b>Large Impact</b> Greater than 2.0%
Indication of no substantial economic impacts	_____ <b>Proceed to Secondary Test</b>	

\* 1990 Census adjusted by CPI inflation rate if necessary.

## Worksheet E

### Data Used in the Secondary Test

Please list the following values used in determining the Secondary Score. Potential sources of the data are indicated.

#### A. Data Collection

Data	Potential Source	Value
Direct Net Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (1)
Overlapping Debt	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (2)
Market Value of Property	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (3)
Bond Rating	Standard and Poors or Moody's	_____ (4)
Community Unemployment Rate	1990 Census of Population Regional Data Centers	_____ % (5)
National Unemployment Rate	Bureau of Labor Statistics (202) 606-6392	_____ % (6)
Community Median Household Income	1990 Census of Population	\$ _____ (7)
State Median Household Income	1990 Census of Population	\$ _____ (8)
Property Tax Collection Rate	Community Financial Statements Town, County or State Assessor's Office	_____ % (9)
Property Tax Revenues	Community Financial Statements Town, County or State Assessor's Office	\$ _____ (10)

## Worksheet E, Continued

### B. Calculation of Indicators

#### 1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) + (2) ) \$ \_\_\_\_\_ (11)

Overall Net Debt as a Percent of Full Market Value of Taxable Property (Calculate: [(11)/(3)] x 100) % (12)

#### 2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a Percent of Full Market Value of Taxable Property (Calculate: [(10)/(3)] x 100) % (13)

**Calculating The Secondary Score**

Please check the appropriate box in each row, and record the corresponding score in the final column. Then, sum the scores and compute the average. Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators.

Indicator	Secondary Indicators			Score
	Weak*	Mid-Range**	Strong***	
Bond Rating Worksheet E, (4)	Below BBB (S&P) Below Baa (Moody's) <input type="checkbox"/>	BBB (S&P) Baa (Moody's) <input type="checkbox"/>	Above BBB (S&P) or Baa (Moody's) <input type="checkbox"/>	
Overall Net Debt as Percent of Full Market Value of Taxable Property Worksheet E, (12)	Above 5% <input type="checkbox"/>	2%-5% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Unemployment Worksheet E, (5)& (6)	Above National Average <input type="checkbox"/>	National Average <input type="checkbox"/>	Below National Average <input type="checkbox"/>	
Median Household Income Worksheet E, (7) & (8)	Below State Median <input type="checkbox"/>	State Median <input type="checkbox"/>	Above State Median <input type="checkbox"/>	
Property Tax Revenues as a Percent of Full Market Value of Taxable Property Worksheet E, (13)	Above 4% <input type="checkbox"/>	2%-4% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Property Tax Collection Rate Worksheet E, (9)	< 94% <input type="checkbox"/>	94% - 98% <input type="checkbox"/>	> 98% <input type="checkbox"/>	

\* Weak is a score of 1 point

SUM

\*\* Mid-Range is a score of 2 points

\*\*\* Strong is a score of 3 points

AVERAGE

## Worksheet G

### Calculation of Total Annualized Project Costs

Capital Costs to be financed (Supplied by applicant)	\$	(1)
Interest Rate for Financing (Expressed as a decimal)		(i)
Time Period of Financing (Assume 10 years*)		10 years (n)
Annualization Factor** = $\frac{i}{(1+i)^{10} - 1} + i$		(2)
Annualized Capital Cost [Calculate: (1) x (2) ]	\$	(3)
Annual Cost of Operation and Maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)***	\$	(4)
<b>Total Annual Cost of Pollution Control Project [ (3) + (4) ]</b>	<b>\$</b>	<b>(5)</b>

\* While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

\*\* Or see Appendix B for calculated annualization factors

\*\*\* For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

## Worksheet H

### Calculation of Earnings Before Taxes With and Without Pollution Control Project Costs

#### A. Earnings Without Pollution Control Project Costs

$$\text{EBT} = \text{R} - \text{CGS} - \text{CO}$$

Where:      EBT =      Earnings Before Taxes  
               R =      Revenues  
               CGS =     Cost of Goods Sold (including the cost of materials, direct labor, indirect labor, rent and heat)  
               CO =     Portion of Corporate Overhead Assigned to the Discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)

#### Three Most Recently Completed Fiscal Years

	19____	19____	19____	
R	\$ _____	\$ _____	\$ _____	(1)
CGS	\$ _____	\$ _____	\$ _____	(2)
CO	\$ _____	\$ _____	\$ _____	(3)
 EBT [ (1) - (2) - (3) ]	<div style="border: 1px solid black; padding: 5px; display: inline-block;">\$ _____</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">\$ _____</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">\$ _____</div>	 (4)

**Considerations:** Have earnings before taxes changed over the three year period? If so, what would a "typical" year's EBT be? Please explain below.

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Worksheet H, Continued

B. Earnings With Pollution Control Project Costs

$$EWPR = EBT - ACPR$$

Where: EWPR = Earnings with Pollution Control Project Costs  
EBT = Earnings Before Taxes (4)  
ACPR = Total Annual Costs of Pollution Control Project [Worksheet G, (5) ]

	19__*
EBT (4)	\$ _____ (5)
ACPR [Worksheet G, (5)]	\$ _____ (6)
EWPR [ (5) - (6) ]	\$ _____ (7)

\* The most recently completed fiscal year

Considerations: Is the discharger expected to have positive earnings after paying the annual cost of pollution control?  Yes  No

Additional Comments:

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Worksheet I

Calculation of Profit Rates  
With and Without Pollution Control Project Costs

A. Profit Rate Without Project Costs

$$PRT = EBT \div R$$

Where: PRT = Profit Rate Before Taxes  
EBT = Earnings Before Taxes  
R = Revenues

Three Most Recently Completed Fiscal Years

	19__	19__	19__	
EBT [Worksheet H, (4)]	_____	_____	_____	(1)
R [Worksheet H, (1)]	_____	_____	_____	(2)
PRT = Calculate: [(1)/(2)]	<input type="text"/>	<input type="text"/>	<input type="text"/>	(3)

Considerations: How have profit rates changed over the three years?

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Is the most recent year typical of the three years?  Yes  No  
(If not, you might want to use an earlier year or years for the analysis)

How do these profit rates compare with the profit rates for this line of business"? Please discuss below.

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## Worksheet I. Continued

### B. Profit Rate With Pollution Control Costs

$$\text{PRPR} = \text{EWPR} \div \text{R}$$

Where:      PRPR = Profit Rate With Pollution Control Costs  
              EWPR = Before-Tax Earnings With Pollution Control Costs  
              R = Revenue

	<b>The Most Recently Completed Fiscal Year</b>	
	19__	
EWPR [Worksheet H, (7)]	\$	(4)
R [Worksheet H, (1)]	\$	(5)
PRPR [Calculate: (4)/(5)]		(6)

Considerations:

What is the percentage change in the profit rate due to pollution control costs ? Calculate as follows:  
 $(\text{PRPR} - \text{PR})/\text{PR} \times 100$

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How does the profit rate with pollution control compare to the profit rate of this line of business?

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## Worksheet J

### Calculation of The Current Ratio

$$CR = CA \div CL$$

Where: CR = Current Ratio  
CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)  
CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

#### Three Most Recently Completed Fiscal Years

	19__	19__	19__
CA	\$ _____	\$ _____	\$ _____ (1)
CL	\$ _____	\$ _____	\$ _____ (2)
CR [Calculate: (1)/(2)]	<input type="text"/>	<input type="text"/>	<input type="text"/> (3)

#### Considerations:

Is the most recent year typical of the three years?  Yes  No  
(If not, you might want to use an earlier year or years for the analysis)

Is the Current Ratio (3) greater than 2.0?  Yes  No

How does the Current Ratio (3) compare with the Current Ratios for other firms in this line of business?

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## Worksheet L

### Debt to Equity Ratio

$$\text{DER} = \text{LTL} \div \text{OE}$$

Where: DER = Debt/Equity Ratio  
LTL = Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)  
OE = Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

#### Three Most Recently Completed Fiscal Years

	19____	19____	19____	
LTL	\$ _____	\$ _____	\$ _____	(1)
OE	\$ _____	\$ _____	\$ _____	(2)
DER [(1)/(2)]	<input type="text"/>	<input type="text"/>	<input type="text"/>	(3)

#### Considerations:

Is the most recent year typical of the three years?  Yes  No  
(If not, you might want to use an earlier year or years for the analysis)

How does the Debt to Equity Ratio compare with the ratio for firms in the same business?

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**Worksheet M**

**Qualitative Description of Estimated change  
in Socioeconomic Indicators  
due to Pollution Control Costs**

Estimated change  
in Median  
Household  
Income (MHI)

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Estimated change  
in the  
unemployment  
rate

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Estimated change  
in overall net debt  
as a percent of  
full market value  
of taxable  
property

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Estimated change  
in % of  
households below  
the poverty line

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Impact on  
commercial  
development  
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Impact on  
Property Values

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## Worksheet N

### Factors to Consider in Making a Determination of Widespread Social and Economic Impacts

- |   |  |      |
|---|--|------|
| Define the affected community in this case; what areas are included.  |  | (1)  |
| Current unemployment rate in affected community (if available).   |  | (2)  |
| Current national unemployment rate.   |  | (3)  |
| Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards.   |  | (4)  |
| Expected unemployment rate in the affected community after compliance with water quality standards (Current # of persons collecting unemployment in affected community + (4)/labor force in affected community. |  | (5)  |
| Median household income in affected community.  |  | (6)  |
| Total number of households in affected community.   |  | (7)  |
| Percent of population below the poverty line in affected community.   |  | (8)  |
| Current expenditures on social services in affected community.  |  | (9)  |
| Expected expenditures on social services due to job losses in the affected community.   |  | (10) |
| Current total tax revenues in the affected community.   |  | (11) |
| Tax revenues paid by the private entity to the affected community.  |  | (12) |

**Worksheet N, continued**

Tax revenues paid by the private entity as a percentage of the affected community's total tax revenues.*	_____	(13)
Current statewide unemployment rates.	_____	(14)
Additional number of persons expected to collect unemployment in the State due to compliance with water quality standards.	_____	(15)
Expected statewide unemployment rate, after compliance with water quality standards (Current # of persons collecting unemployment in State + (15)/labor force in State.	_____	(16)
Current expenditures on social services in State.	_____	(17)
Expected statewide expenditures on social services due to job losses.	_____	(18)

\* In some cases, the affected community will include more than just the municipality in which the private entity is located. If so, the analysis should consider the private entity's tax revenues as a percentage of the tax revenues for only the municipality in which the entity is located.

**Worksheet O**

**Pollution Control Project  
Summary Information**

Design Capacity of the Pollution Control System

\_\_\_\_\_

Expected Excess Capacity after Completion of Project

\_\_\_\_\_ %

Projected Groundbreaking Date

\_\_\_\_\_

Projected Date of Completion

\_\_\_\_\_

Please describe the pollution control project being proposed. Include description of all pollution prevention activities included in the project. (Attach additional page if necessary).

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Please describe the other pollution control options considered, including pollution prevention activities. Explain why each option was rejected. (Attach additional page if necessary).

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## Worksheet P

### Public-Sector Pollution Control Calculation of Total Annualized Project Costs

#### A. Capital Costs

Capital Cost of Project	\$ _____
Other One-Time Costs of Project (Please List, if any):	
_____	\$ _____
_____	\$ _____
_____	\$ _____
<b>Total Capital Costs (Sum column)</b>	<b>\$ (1)</b>
Portion of Capital Costs to be Paid for with Grant Monies	\$ (2)
Capital Costs to be Financed [Calculate: (1) - (2) ]	\$ (3)
Type of financing (e.g., G.O. bond, revenue bond, bank loan)	_____
Interest Rate for Financing (expressed as decimal)	_____ (i)
Time Period of Financing (in years)	_____ (n)
Annualization Factor = $\frac{i}{(1+i)^n - 1} + i$ (or see Appendix B)	_____ (4)
<b>Annualized Capital Cost [Calculate: (3) x (4) ]</b>	<b>_____ (5)</b>

#### B. Operating and Maintenance Costs

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)

_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____
<b>Total Annual O &amp; M Costs (Sum column)</b>	<b>\$ (6)</b>

#### C. Total Annual Cost of Pollution Control Project

Total Annual Cost of Pollution Control Project [ (5) + (6) ]	\$ (7)
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## Worksheet Q

### Calculation of Total Annual Pollution Control Costs Per Household

#### A. Current Pollution Control Costs:

Total Annual Cost of Existing Pollution Control	\$	(1)
Amount of Existing Costs Paid By Households	\$	(2)
Percent of Existing Costs Paid By Households		%(3)
Number of Households*		(4)
Annual Cost Per Household [Calculate: (2)/(4) ]	\$	(5)

\* Do not use number of hook-ups.

#### B. New Pollution Control Costs

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

a) Yes [fill in percent from (3) ]

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 percent.(6a)

b) No, they are expected to pay

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 percent.(6b)

c) No, they are expected to pay based on flow. (Continue on Worksheet Q, Option A)

Total Annual Cost of Pollution Control Project [Line (7), Worksheet P]	\$	(7)
Proportion of Costs Households Are Expected to Pay [ (6a) or (6b) ]		(8)
Amount to Be Paid By Households [Calculate: (9) x (10) ]	\$	(9)
Annual Cost per Household [Calculate: (11)/(4) ]	\$	(10)

#### C. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control Per Household (5) + (10)

\$ (11)
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## Worksheet Q: Option A

### Calculation of Total Annual Pollution Control Costs Per Household Based on Flow

#### A. Calculating Project Costs Incurred By Households Based on Flow

Expected Total Usage of Project (eg. MGD for Wastewater Treatment)	(1)
Usage due to Household Use (MGD of Household Wastewater)	(2)
Percent of Usage due to Household Use [Calculate: (2)/(1) ]	%(3)
Total Annual Cost of Pollution Control Project	\$ (4)
Industrial Surcharges, if any	\$ (5)
Costs to be Allocated [Calculate: (4) - (5) ]	\$ (6)
Amount to Be Paid By Households [Calculate: (3) x (6) ]	\$ (7)
Annual Project Cost per Household [Calculate: (7)/Worksheet Q, (4) ]	\$ (8)

#### C. Total Annual Pollution Control Cost Per Household

Annual Existing Costs Per Household [Worksheet Q, (5) ]	\$ (9)
Total Annual Cost of Pollution Control Per Household [ (8) + (9) ]	\$ (10)

## Worksheet R

### Private-Sector Development Calculation of Total Annualized Project Costs

Capital Costs to be financed (Supplied by applicant)	\$	(1)
Interest Rate for Financing (Expressed as a decimal)		(i)
Time Period of Financing (Assume 10 years*)		10 years (n)
Annualization Factor** = $\frac{i}{(1+i)^{10} - 1} + i$		(2)
Annualized Capital Cost [Calculate: (1) x (2) ]	\$	(3)
Annual Cost of Operation and Maintenance (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement)***	\$	(4)
<b>Total Annual Cost of Pollution Control Project [ (3) + (4) ]</b>	<b>\$</b>	<b>(5)</b>

\* While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

\*\* Or see Appendix B for calculated annualization factors

\*\*\* For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

## Worksheet S

### Municipal Preliminary Screener

The Municipal Preliminary Screener indicates quickly whether a public entity will not incur any substantial economic impacts as a result of the proposed pollution control project. The formula is as follows:

$$\frac{\text{Total Annual Pollution Control Cost per Household}}{\text{Median Household Income}^*} \times 100$$

#### A. Calculation of The Municipal Preliminary Screener

Total Annual Pollution Control Cost Per Household [Worksheet C, (11) or Worksheet C, Option A (10) ]	\$	(1)
Median Household Income*	\$	(2)
<b>Municipal Preliminary Screener</b> (Calculate: [(1)/(2)] x 100)		%(3)

#### B. Evaluation of The Municipal Preliminary Screener

If the Municipal Preliminary Screener is clearly less than 1.0%, then it is assumed that the cost will not impose an undue financial burden. In this case, it is not necessary to continue with the Secondary Test. Otherwise, it is necessary to continue.

Benchmark Comparison:

<b>Little Impact</b> Less than 1.0%	<b>Mid-Range Impact</b> 1.0% - 2.0%	<b>Large Impact</b> Greater than 2.0%
Indication of no substantial economic impacts	_____→ Proceed to Secondary Test	

\* 1990 Census adjusted by CPI inflation rate if necessary.

## Worksheet T

### Data Used in the Secondary Test

Please list the following values used in determining the Secondary Score. Potential sources of the data are indicated.

#### A. Data Collection

Data	Potential Source	Value
Direct Net Debt	Community Financial Statements Town, County or State Assessor's Office	\$ (1)
Overlapping Debt	Community Financial Statements Town, County or State Assessor's Office	\$ (2)
Market Value of Property	Community Financial Statements Town, County or State Assessor's Office	\$ (3)
Bond Rating	Standard and Poors or Moody's	(4)
Community Unemployment Rate	1990 Census of Population Regional Data Centers	%(5)
National Unemployment Rate	Bureau of Labor Statistics (202) 606-6392	%(6)
Community Median Household Income	1990 Census of Population	\$ (7)
State Median Household Income	1990 Census of Population	\$ (8)
Property Tax Collection Rate	Community Financial Statements Town, County or State Assessor's Office	%(9)
Property Tax Revenues	Community Financial Statements Town, County or State Assessor's Office	\$ (10)

## Worksheet T, Continued

### B. Calculation of Indicators

#### 1. Overall Net Debt as a Percent of Full Market Value of Taxable Property

Overall Net Debt (Calculate: (1) + (2) )

\$ \_\_\_\_\_ (11)

Overall Net Debt as a Percent of Full Market Value of Taxable Property (Calculate: [(11)/(3)] x 100)

%(12)
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#### 2. Property Tax Revenues as a Percent of Full Market Value of Taxable Property

Property Tax Revenues as a Percent of Full Market Value of Taxable Property (Calculate: [(10)/(3)] x 100)

%(13)
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## Worksheet U

### Calculating The Secondary Score

Please check the appropriate box in each row, and record the corresponding score in the final column. Then, sum the scores and compute the average. Remember, if one of the debt or socioeconomic indicators is not available, average the two financial management indicators and use this averaged value as a single indicator with the remaining indicators.

Indicator	Secondary Indicators			Score
	Weak*	Mid-Range**	Strong***	
Bond Rating Worksheet T, (4)	Below BBB (S&P) Below Baa (Moody's) <input type="checkbox"/>	BBB (S&P) Baa (Moody's) <input type="checkbox"/>	Above BBB (S&P) or Baa (Moody's) <input type="checkbox"/>	
Overall Net Debt as Percent of Full Market Value of Taxable Property Worksheet T, (12)	Above 5% <input type="checkbox"/>	2%-5% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Unemployment Worksheet T, (5)& (6)	Above National Average <input type="checkbox"/>	National Average <input type="checkbox"/>	Below National Average <input type="checkbox"/>	
Median Household Income Worksheet T, (7) & (8)	Below State Median <input type="checkbox"/>	State Median <input type="checkbox"/>	Above State Median <input type="checkbox"/>	
Property Tax Revenues as a Percent of Full Market Value of Taxable Property Worksheet T, (13)	Above 4% <input type="checkbox"/>	2%-4% <input type="checkbox"/>	Below 2% <input type="checkbox"/>	
Property Tax Collection Rate Worksheet T, (9)	< 94% <input type="checkbox"/>	94% - 98% <input type="checkbox"/>	> 98% <input type="checkbox"/>	

\* Weak is a score of 1 point

SUM

\*\* Mid-Range is a score of 2 points

\*\*\* Strong is a score of 3 points

AVERAGE

Worksheet V

Calculation of Earnings Before Taxes

**A. Earnings Without Pollution Control Project Costs**

$$\text{EBT} = \text{R} - \text{CGS} - \text{CO}$$

**B. Earnings With Pollution Control Project Costs**

$$\text{EWPR} = \text{EBT} - \text{ACPR}$$

Where: EBT = Earnings Before Taxes  
EWPR = Earnings with Pollution Project Costs  
R = Revenues  
CGS = Cost of Goods Sold (including the cost of materials, direct labor, indirect labor, rent and heat)  
CO = Portion of Corporate Overhead Assigned to the Discharger (selling, general, administrative, interest, R&D expenses, and depreciation on common property)  
ACPR = Total Annual Costs of Pollution Control Project [Worksheet R (5)]

R	\$ _____	(1)
CGS	\$ _____	(2)
CO	\$ _____	(3)
<b>EBT [ (1) - (2) - (3) ]</b>	<b>\$</b> <input type="text"/>	<b>(4)</b>
ACPR [ Worksheet R (5) ]	\$ _____	(5)
<b>EWPR [ (4) - (5) ]</b>	<b>\$</b> <input type="text"/>	<b>(6)</b>

**Worksheet W**

**Calculation of Profit Rates**

**A. Profit Rate Without Project Costs**

$$\text{PRT} = \text{EBT} \div \text{R}$$

**B. Profit Rate With Pollution Control Costs**

$$\text{PRPR} = \text{EWPR} \div \text{R}$$

Where:      PRT =      Profit Rate Before Taxes  
              PRPR =     Profit Rate with Pollution Control Costs  
              EBT =      Earnings Before Taxes  
              EWPR =    Before-Tax Earnings with Pollution Control Costs  
              R =        Revenues

EBT [Worksheet V, (4)] \_\_\_\_\_ (1)

R [Worksheet V, (1)] \_\_\_\_\_ (2)

**PRT = Calculate: [(1)/(2)]**  (3)

EWPR [Worksheet V, (6)] \$ \_\_\_\_\_ (4)

R [Worksheet V, (1)] \$ \_\_\_\_\_ (5)

**PRPR [Calculate: (4)/(5)]**  (6)

## Worksheet X

### Calculation of The Current Ratio

$$CR = CA \div CL$$

- Where:
- CR = Current Ratio
  - CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)
  - CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

CA	\$ _____	(1)
CL	\$ _____	(2)
CR [Calculate: (1)/(2)]	<input type="text"/>	(3)

## Worksheet Y

### Calculation of Beaver's Ratio

$$BR = CF \div TD$$

Where: BR = Beaver's Ratio  
CF = Cash Flow  
TD = Total Debt

#### Cash Flow:

Net Income After Taxes	\$	(1)
Depreciation	\$	(2)
CF [Calculate: (1) + (2)]	\$	(3)

#### Total Debt:

Current Debt	\$	(4)
Long-Term Debt	\$	(5)
Total Debt	\$	(6)

#### Beaver's Ratio:

BR [(3) / (6)]	<input type="text"/>	(7)
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## Worksheet Z

### Debt to Equity Ratio

$$\text{DER} = \text{LTL} \div \text{OE}$$

Where: DER = Debt/Equity Ratio  
LTL = Long-Term Liabilities (long-term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)  
OE = Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

LTL	\$ _____	(1)
OE	\$ _____	(2)
DER [(1)/(2)]	<input type="text"/>	(3)

**Worksheet AA**

**Public-Sector Development  
Qualitative Description of Estimated Change  
in Socioeconomic Indicators  
due to Pollution Control Costs**

Estimated change  
in Median  
Household  
Income (MHI)

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Estimated change  
in the  
unemployment  
rate

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Estimated change  
in overall net debt  
as a percent of  
full market value  
of taxable  
property

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Estimated change  
in % of  
households below  
the poverty line

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Impact on  
commercial  
development  
potential

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Impact on  
Property Values

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**Worksheet AB**

**Private-Sector Development**

**Factors to Consider in Making a Determination of Widespread Social and Economic Impacts**

- Define the affected community in this case; what areas are included. \_\_\_\_\_ (1)
- Current unemployment rate in affected community (if available). \_\_\_\_\_ (2)
- Current national unemployment rate. \_\_\_\_\_ (3)
- Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards. \_\_\_\_\_ (4)
- Expected unemployment rate in the affected community after compliance with water quality standards (Current # of persons collecting unemployment in affected community + (4)/labor force in affected community). \_\_\_\_\_ (5)
- Median household income in affected community. \_\_\_\_\_ (6)
- Total number of households in affected community. \_\_\_\_\_ (7)
- Percent of population below the poverty line in affected community. \_\_\_\_\_ (8)
- Current expenditures on social services in affected community. \_\_\_\_\_ (9)
- Expected expenditures on social services due to job losses in the affected community. \_\_\_\_\_ (10)
- Current total tax revenues in the affected community. \_\_\_\_\_ (11)
- Tax revenues paid by the private entity to the affected community. \_\_\_\_\_ (12)

**Worksheet AB, continued**

Tax revenues paid by the private entity as a percentage of the affected community's total tax revenues.*	_____	(13)
Current statewide unemployment rates.	_____	(14)
Additional number of persons expected to collect unemployment in the State due to compliance with water quality standards.	_____	(15)
Expected statewide unemployment rate, after compliance with water quality standards (Current # of persons collecting unemployment in State + (15)/labor force in State.	_____	(16)
Current expenditures on social services in State.	_____	(17)
Expected statewide expenditures on social services due to job losses.	_____	(18)

\* In some cases, the affected community will include more than just the municipality in which the private entity is located. If so, the analysis should consider the private entity's tax revenues as a percentage of the tax revenues for only the municipality in which the entity is located.



# **Combined Sewer      Final Overflows—Guidance for Financial Capability Assessment and Schedule Development**

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# I. INTRODUCTION

## Background

Combined sewer systems (CSSs) are wastewater collection systems designed to carry sanitary sewage (consisting of domestic, commercial and industrial wastewater) and storm water (surface drainage from rainfall or snow melt) in a single pipe to a treatment facility. CSSs serve about 43 million people in approximately 1,100 communities nationwide. Most of these communities are located in the Northeast and Great Lakes regions. During dry weather, CSSs convey domestic, commercial, and industrial wastewater. In periods of rainfall or snow melt, total wastewater flows can exceed the capacity of the CSS and/or treatment facilities. When this occurs, the CSS is designed to overflow directly to surface water bodies, such as lakes, rivers, estuaries, or coastal waters. These overflows - called combined sewer overflows (CSOs) - can be a major source of water pollution in communities served by CSSs.

Because CSOs contain untreated domestic, commercial, and industrial wastes, as well as surface runoff, many types of contaminants can be present. Contaminants may include pathogens, oxygen-demanding pollutants, suspended solids, nutrients, toxics, and floatable matter. Because of these contaminants and the volume of the flows, CSOs can cause a variety of adverse impacts on the physical characteristics of surface water, impair the viability of aquatic habitats, and pose a potential threat to drinking water supplies. CSOs have been shown to be a major contributor to use impairment and aesthetic degradation of many receiving waters and have contributed to shellfish harvesting restrictions, beach closures, and even occasional fish kills.

## History of the CSO Control Policy

Historically, the control of CSOs has proven to be extremely complex. This complexity stems partly from the difficulty in quantifying combined sewer overflow (CSO) impacts on receiving water quality and the site specific variability in the volume, frequency, and characteristics of CSOs. In addition, the financial considerations for communities with CSOs can be significant. The U.S. Environmental Protection Agency (EPA) estimates the CSO abatement costs for the 1,100 communities served by CSSs to be approximately \$41.2 billion.

To address these challenges, EPA's Office of Water issued a National Combined Sewer Overflow Control Strategy on August 10, 1989 (54 *Federal Register* 37370). This Strategy reaffirmed that CSOs are point source discharges subject to National Pollutant Discharge Elimination System (NPDES) permit requirements and Clean Water Act (CWA) requirements.

The CSO Strategy recommended that all CSOs be identified and categorized according to their status of compliance with these requirements. It also set forth three objectives:

- Ensure that if CSOs occur, they are only as a result of wet weather
- Bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA
- Minimize the impacts of CSOs on water quality, aquatic biota, and human health.

In addition, the CSO Strategy charged all States with developing state-wide permitting strategies designed to reduce, eliminate, or control CSOs.

Although the CSO Strategy was successful in focusing increased attention on CSOs, it fell short in resolving many fundamental issues. In mid-1991, EPA initiated a process to accelerate implementation of the Strategy. The process included negotiations with representatives of the regulated community, State regulatory agencies, and environmental groups. These negotiations were conducted through the Office of Water Management Advisory Group. The initiative resulted in the development of a CSO Control Policy, which was published in the *Federal Register* on April 19, 1994 (59 *Federal Register* 18688). The intent of the CSO Control Policy is to:

- Provide guidance to permittees with CSOs, NPDES permitting and enforcement authorities, and State water quality standards (WQS) authorities
- Ensure coordination among the appropriate parties in planning, selecting, designing, and implementing CSO management practices and controls to meet the requirements of the CWA
- Ensure public involvement during the decision-making process.

The CSO Control Policy contains provisions for developing appropriate, site-specific NPDES permit requirements for all CSSs that overflow due to wet weather events. It also announces an enforcement initiative that requires the immediate elimination of overflows that occur during dry weather and ensures that the remaining CWA requirements are complied with as soon as possible.

## Key Elements of the CSO Control Policy

The CSO Control Policy contains four key principles to ensure that CSO controls are cost-effective and meet the requirements of the CWA:

- Provide clear levels of control that would be presumed to meet appropriate health and environmental objectives
- Provide sufficient flexibility to municipalities, especially those that are financially disadvantaged, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements
- Allow a phased approach for implementation of CSO controls considering a community's financial capability
- Review and revise, as appropriate, WQS and their implementation procedures when developing long-term CSO control plans to reflect the site-specific wet weather impacts of CSOs.

In addition, the CSO Control Policy clearly defines expectations for permittees, State WQS authorities, and NPDES permitting and enforcement authorities. These expectations include the following:

- Permittees should immediately implement the nine minimum controls (NMC), which are technology-based actions or measures designed to reduce CSOs and their effects on receiving water quality, as soon as possible but no later than January 1, 1997. More information on the NMC can be found in the EPA document *Combined Sewer Overflows: Guidance for Nine Minimum Controls* (EPA 832-B-95-003)
- Permittees should give priority to environmentally sensitive areas
- Permittees should develop long-term control plans (LTCPs) for controlling CSOs. A permittee may use one of two approaches: 1) demonstrate that its plan is adequate to meet the water quality-based requirements of the CWA ("demonstration approach"), or 2) implement a minimum level of treatment (e.g., primary clarification of at least 85 percent of the collected combined sewage flows) that is presumed to meet the water quality-based requirements of the CWA, unless data indicate otherwise ("presumption approach")
- WQS authorities should review and revise, as appropriate, State WQS during the CSO long-term planning process
- NPDES permitting authorities should consider the financial capability of permittees

when reviewing CSO control plans.

Table 1 illustrates the roles and responsibilities of permittees, NPDES permitting and enforcement authorities, and state WQS authorities.

In addition to these key elements and expectations, the CSO Control Policy also addresses important issues such as ongoing or completed CSO control projects, public participation, small communities and watershed planning.

## ROLES AND RESPONSIBILITIES

Table 1

Permittee	NPDES Permitting Authority	NPDES Enforcement Authority	State WQS Authorities
<ul style="list-style-type: none"> <li>• Evaluate and implement NMC</li> <li>• Submit documentation of NMC implementation by January 1, 1997</li> <li>• Develop LTCP and submit for review to NPDES permitting authority</li> <li>• Support the review of WQS in CSO-impacted receiving water bodies</li> <li>• Comply with permit conditions based on narrative WQS</li> <li>• Implement selected CSO controls from LTCP</li> <li>• Perform post-construction compliance monitoring</li> <li>• Reassess overflows to sensitive areas</li> <li>• Coordinate all activities with NPDES permitting authority, State WQS authority, and State watershed personnel</li> </ul>	<ul style="list-style-type: none"> <li>• Reassess/revise CSO permitting strategy</li> <li>• Incorporate into Phase I permits CSO-related conditions (e.g., NMC implementation and documentation and LTCP development)</li> <li>• Review documentation of NMC implementation</li> <li>• Coordinate review of LTCP components throughout the LTCP development process and accept/approve permittee's LTCP</li> <li>• Coordinate the review and revision of WQS as appropriate</li> <li>• Incorporation into Phase II permits CSO-related conditions (e.g., continued NMC implementation and LTCP implementation)</li> <li>• Incorporate implementation schedule into an appropriate enforceable mechanism</li> <li>• Review implementation activity reports (e.g., compliance schedule progress reports)</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that CSO requirements and schedules for compliance are incorporated into appropriate enforceable mechanisms</li> <li>• Monitor compliance with Jan 1, 1997, deadline for NMC implementation and documentation</li> <li>• Take appropriate enforcement action against dry weather overflows</li> <li>• Monitor compliance with Phase I, Phase II, and post-Phase II permits and take enforcement action as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Review WQS in CSO-impacted receiving water bodies</li> <li>• Coordinate review with LTCP development</li> <li>• Revise WQS as appropriate</li> <li>Development of site-specific criteria</li> <li>Modification of designated use to                             <ul style="list-style-type: none"> <li>- Partial use reflecting specific situations</li> <li>- Define use more explicitly</li> </ul> </li> <li>Temporary variance from WQS</li> </ul>

## Guidance to Support Implementation of the CSO Control Policy

To help permittees and NPDES permitting and WQS authorities implement the provisions of the CSO Control Policy, EPA has developed the following documents:

- *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA 832-B-95-002)
- *Combined Sewer Overflows—Guidance for Nine Minimum Controls* (EPA 832-B-95-003)
- *Combined Sewer Overflows—Guidance for Screening and Ranking* (EPA 832-B-95-004)
- *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA 832-B-97-001)
- *Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development* (EPA 832-B-97-004)
- *Combined Sewer Overflows—Guidance for Funding Options* (EPA 832-B-95-007)
- *Combined Sewer Overflows—Guidance for Permit Writers* (EPA 832-B-95-008)

### Goal of this Guidance

The CSO Policy recognizes the need to address the relative importance of environmental and financial issues when developing an implementation schedule for CSO controls to be contained in the LTCP and the NPDES permit or other enforceable mechanism. According to the CSO Policy, an implementation schedule “may be phased based on the relative importance of adverse impacts upon WQS and designated uses, priority projects identified in the long-term plan, and on a permittee’s financial capability.”

This guidance has two goals. The first goal is to provide a planning tool for evaluating the financial resources a permittee has available to implement CSO controls. This assessment will involve the use of the following financial capability indicators listed in the CSO Policy:

- Total annual wastewater and CSO control cost per household as a percent of median household income
- Bond ratings
- Overall net debt as percent of full market property value

- Unemployment rate
- Median household income
- Property tax revenue collection rate
- Property tax revenues as a percent of full market property value

It must be emphasized that the financial indicators found in this guidance might not present the most complete picture of a permittee's financial capability to fund the CSO controls. However, the financial indicators do provide a common basis for financial burden discussions between the permittee and EPA and state NPDES authorities. Since flexibility is an important aspect of the CSO Policy, permittees are encouraged to submit any additional documentation that would create a more accurate and complete picture of their financial capability.

Although this guidance focuses on the role of financial capability for development of an implementation schedule for CSO controls, the financial capability analysis process can be useful for the identification and evaluation of long-term control alternatives in the LTCP.

The second goal is to assist the permittee, EPA and state NPDES authorities in cooperatively developing CSO control implementation schedules. This will involve an evaluation of the following environmental and financial considerations listed in the CSO Policy:

- Eliminating overflows to sensitive areas
- Use impairment
- Financial capability
- Grant and loan availability
- Previous and current sewer user fees and rate structures
- Other viable funding mechanisms and sources of financing

This guidance does not recommend specific schedules for implementation of the CSO controls based on financial capability or other considerations identified in the CSO Policy. It does, however, provide general boundaries to aid all parties in negotiating reasonable and effective schedules for implementation of the CSO controls.

It is important to recognize that scheduling flexibility is not the only form of relief available to permittees. The CWA and EPA regulations provide mechanisms for the review and revision of WQS. The CSO Policy also encourages the "review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs." During the process of developing the

LTCP, the permittee should consult with NPDES and WQS authorities to share information on the water quality impacts of CSOs, the attainability of WQS, and the appropriate water quality-based requirements of the permit. It may be appropriate to conduct a use attainability analysis and revisit existing designated uses in order to ensure that the LTCP selected will be sufficient to attain WQS. EPA's "Interim Economic Guidance for Water Quality Standards-Workbook"(EPA-823-B-95-002) provides an approach for assessing whether a water pollution project will impose "substantial and widespread social and economic impacts," as defined in EPA regulations.

## **Organization of Guidance**

Section II summarizes a two phase approach for assessing a permittee's financial capability to implement CSO controls. Section III describes the first phase which calculates the financial impact of wastewater and CSO controls on individual households. Section IV describes the second phase used to calculate a permittee's debt, socioeconomic and financial conditions. The results of the first and second phases are combined to give an overall assessment of a permittee's financial capability to be used in CSO schedule development. Although financial capability is only one factor in schedule development, a major portion of this guidance is devoted to financial capability assessment because of the complexity of the process and its importance. Section V describes the schedule development process for implementing CSO controls, and details how environmental and financial considerations influence schedule development.

## **Audience**

This guidance is designed for use by permittees, EPA and state NPDES authorities, and other personnel with CSO planning and permitting responsibilities. It is written in a format that allows individuals with limited municipal financial assessment experience to conduct CSO financial capability assessments and negotiate reasonable CSO implementation schedules. Individuals with experience in establishing schedules for enforcement orders and reviewing financial capability assessments under the Water Quality Standards, Construction Grants and State Revolving Fund (SRF) programs will be able to quickly and efficiently conduct the assessment detailed in this guidebook.

## II. CSO FINANCIAL CAPABILITY ASSESSMENT APPROACH

This section describes a process for evaluating parameters that measure a permittee's financial capability to implement CSO controls. The process reflects the experience of EPA in the Water Quality Standards (WQS) program, Construction Grants program, State Revolving Fund (SRF) program and the water enforcement program. Experience with these programs provides the foundation upon which EPA has built the CSO financial capability assessment approach.

In the WQS program, economic factors are considered in the process of modifying WQS. State WQS authorities conduct economic analysis of the impacts that will result from treatment levels beyond the technology-based requirements of the Clean Water Act. EPA's "Interim Economic Guidance for Water Quality Standards" (EPA 823-B-95-002) provides an approach for assessing substantial and widespread social and economic impacts of specific water pollution control projects. The process to identify "substantial" impacts is similar to the process used in this guidance to analyze financial capability and its implications for scheduling CSO controls.

Under the Construction Grants Program, financial capability assessments were conducted by municipalities and reviewed by EPA to demonstrate that municipalities had the ability to pay for the capital investments and the costs for operation and maintenance of the wastewater facilities. The assessments measured the financial conditions of the municipality and the financial burden the proposed projects imposed on households. Some of the financial indicators used in the demonstrations were similar to those used in this guidance. The demonstration procedure is described in EPA's "Financial Capability Guidebook" (1984).

As part of SRF program implementation, states devised financial capability assessment procedures for loan applicants. Often the procedures include a review of the same financial indicators described in this document.

The Agency's water enforcement program conducts detailed evaluations of a permittee's current financial conditions to assess the amount of penalty that can be borne by the permittee for violations of the CWA. The evaluations frequently include financial indicators used in this guidance.

The CSO financial capability assessment process also reflects the approach taken by bond rating agencies and other investment industry firms to assess a municipality's or wastewater utility's overall financial condition and credit capacity. The bond rating agencies generally use the same types of financial information when they evaluate specific bond issues. Rating agencies evaluate this information to determine the overall financial health of an issuer and identify any factors that could make it difficult for the permittee to repay its bonds. The approach developed for the CSO financial capability assessment incorporates the principles used by the rating agencies.

## The Two-Phase Approach

The guidance presents a two-phase approach to assessing a permittee's financial capability. The first phase identifies the combined impact of wastewater and CSO control costs on individual households. The second phase examines the debt, socioeconomic, and financial conditions of a permittee. The results of the two-phase analysis are combined in a Financial Capability Matrix. Permittees and the WQS and NPDES authorities can use this matrix to assess the financial burden of the CSO control costs and establish reasonable schedules to implement the CSO controls.

Phase one determines a Residential Indicator. This indicator is the permittee's average cost per household (CPH) for wastewater treatment (WWT) and CSO controls as a percentage of the local median household income (MHI). It reflects the residential share of current and planned WWT and CSO controls needed to meet the requirements of the CWA. A value range for this indicator characterizes whether the costs impose a "low," "mid-range" or "high" financial impact on residential users.

The second phase develops the Permittee Financial Capability Indicators. Six indicators are used to evaluate the debt, socioeconomic, and financial conditions that affect a permittee's financial capability to implement the CSO controls. These indicators serve as the basis for a second phase analysis that will characterize the permittee's financial capability as "weak," "mid-range" or "strong."

A Financial Capability Matrix combines the Residential Indicator (first phase) and Permittee Financial Capability Indicators (second phase) to give an overall assessment of the permittee's financial capability. This assessment can be used to help establish an appropriate CSO control implementation schedule.

Since flexibility is an important component of the CSO Policy, WQS authorities, NPDES authorities, EPA personnel, and permittees should communicate throughout the CSO control planning process to coordinate the development of an effective LTCP. This guidance document provides all CSO participants with a structured yet flexible approach for evaluating the financial burden CSO controls place on permittees. It also recognizes the importance of this financial burden when establishing a CSO control implementation schedule. The financial capability information developed in this guidance provides a basis for the permittee and the NPDES authorities to negotiate the implementation schedule for the CSO controls. However, when a permittee believes that there are unique circumstances that would affect the conclusion of this guidance, the permittee may submit documentation of its unique financial conditions to the appropriate EPA or State NPDES authorities for consideration.

## **Financial Benchmarks and Information Sources**

The information used to develop the indicators needed for the financial assessment is drawn from several different sources. In general, this information should be available through a combination of local, state, and Federal sources. Project cost information is available in the LTCP. Socioeconomic information, such as median household income, is available from census data. Detailed financial information is available from a community's annual financial statements. Financial statements may be obtained directly from a community or, in most states, from the state auditor's office which maintains a central file of audited reports. When the permittee's service area involves more than one jurisdiction, it will be necessary to examine data for each jurisdiction to develop the necessary data.

### III. PHASE ONE: THE RESIDENTIAL INDICATOR

The Residential Indicator measures the financial impact of the current and proposed WWT and CSO controls on residential users. Development of this indicator starts with the determination of the current and proposed WWT and CSO control costs per household (CPH). Second, the service area's CPH estimate and the median household income (MHI) are used to calculate the Residential Indicator. Finally, the Residential Indicator is compared to established financial impact ranges to determine whether CSO controls will produce a possible high, mid-range or low financial impact on the permittee's residential users. Worksheets are provided to aid in developing the Residential Indicator.

#### **Developing CPH Estimate**

The first step in developing the CPH is to determine the permittee's total WWT and CSO costs by adding together the current costs for existing wastewater treatment operations and the projected costs for any proposed WWT and CSO controls. The next step is to calculate the residential share of the total WWT and CSO costs. The final step is to calculate the CPH by dividing the residential share of total WWT and CSO costs by the number of households in the permittee's total wastewater service area.

Current WWT costs are defined as current annual wastewater operating and maintenance expenses (excluding depreciation) plus current annual debt service (principal and interest). This fairly represents cash expenses for current wastewater treatment operations. (Expenses for funded depreciation, capital replacement funds, or other types of capital reserve funds are not included in current WWT costs, because they represent a type of savings account rather than an actual operation and maintenance expense.)

Estimates of projected costs are made for any proposed WWT projects and the CSO controls. Any concerns about including specific proposed WWT projects or CSO controls in the projected costs, or the length of the planning period, should be discussed with the appropriate NPDES permitting and enforcement authorities. These costs are adjusted to current dollars (i.e., deflated). These include projected operation and maintenance expenses plus projected debt service costs for any proposed WWT and the CSO controls. The residential or household costs exclude the portion of expenses attributable to commercial, governmental and industrial wastewater discharges. The information and calculations used to develop the CPH and the Residential Indicator are presented in Worksheets 1 and 2 and their instructions.

## Worksheet 1 Instructions

Enter the requested data on lines 100 through 109. The operation and maintenance costs on lines 100 and 103 should include all significant cost categories, such as labor, chemicals, utilities, administration, and equipment replacement. Do not include depreciation on line 100 or line 103. Adjust the projected annual WWT and CSO costs to current dollars using the average annual national Consumer Price Index (CPI) inflation rate for the past five years available from the Bureau of Labor Statistics. The CPI is used as a simple and reliable method of indexing projected WWT costs and household income. For example, if the most recent five year average CPI is 4 percent, and the projected annual O&M and debt service costs will begin in 2 years, adjust the projected costs with the following formula:

$$\text{Adjusted Projected Costs (Current Dollars)} = \text{Projected Costs} \times \text{Adjustment Factor}$$

The adjustment factor can be calculated using the following formula or the present value factor from the table on page 55:

$$\text{Adjustment Factor} = \frac{1}{(1 + \text{CPI})^{\text{years}}} = \frac{1}{(1 + .04)^2} = .925$$

The annualized debt service cost information for the projected WWT facilities and projected CSO controls (Line 104) can be calculated using an annualization factor obtained from the table on page 56, which reflects the local borrowing interest rate and borrowing term of the permittee. For example, if the adjusted projected debt costs (current dollars) are \$25,000,000 and typical borrowing terms include an interest rate of eight percent over 20 years, then costs can be annualized with the following calculation:

$$\text{Annual Debt Service Costs} = \text{Adjusted Debt Costs} \times \text{Annualization Factor}$$

$$\text{Annual Debt Service Cost} = \$25,000,000 \times .1019 = \$2,547,500$$

The annualization factor can be calculated using the following formula:

$$\text{Annualization Factor} = \frac{\text{Interest Rate}}{(1 + \text{Interest Rate})^{\text{years}} - 1} + \text{Interest Rate} = \frac{.08}{(1 + .08)^{20} - 1} + .08 = .1019$$

The annualized debt service cost for the projected WWT facilities and projected CSO controls is entered on line 104. Add the current and projected wastewater treatment and projected CSO control costs to estimate the total WWT and CSO costs (line 102 + line 105).

Calculate the residential share of the total cost (line 106) and enter on line 107. The residential share of total costs (line 107) is computed by multiplying the percent of total wastewater flow including infiltration and inflow attributable to residential users by the total costs (line 106). For example, for a permittee with the following characteristics:

Total Costs:	\$12,000,000
Residential Flow:	10.5 Million Gallons per Day
Total Flow:	13.1 Million Gallons per Day

The residential share of the total cost is:

$$\begin{aligned}
 \text{Residential Share of Costs} &= \text{Total Costs} \times \frac{\text{Residential Wastewater Flow}}{\text{Total Wastewater Flow}} \\
 \text{Residential Share of Costs} &= \$12,000,000 \times \frac{10.5 \text{ Million Gallons Per Day}}{13.1 \text{ Million Gallons Per Day}} \\
 &= \$9,600,000
 \end{aligned}$$

Calculate the CPH (line 109) by dividing total residential share costs (line 107) by the total number of households (line 108) in the permittee's total wastewater service area.

### Data Sources

The permittee's latest financial reports should be available to develop the current wastewater treatment costs. In order to comply with accounting requirements, most permittees develop a combined statement of revenues, expenses, and changes in fund balance. These reports should be available directly from the permittee, or, in some states, from central records kept by the state auditor or other state offices. (Many states conduct audits and generate financial reports - i.e., balance sheet, statement of revenues, expenses, and changes in fund balance, and statement of cash flows, for each permittee.) Projected costs and households in the wastewater service area should be available through planning documents. The Bureau of Labor Statistics frequently has data on the number of households in the service area.

The Consumer Price Index rate (CPI) should be the average rate for the previous five years. The CPI is available through the Bureau of Labor Statistics.

**COST PER HOUSEHOLD  
Worksheet 1**

	<u>Line Number</u>
<b>Current WWT Costs</b>	
• Annual Operations and Maintenance Expenses (Excluding Depreciation)	_____ 100
• Annual Debt Service (Principal and Interest)	_____ 101
*Subtotal* (Line 100 + Line 101)	_____ 102
 <b>Projected WWT and CSO Costs (Current Dollars)</b>	
• Estimated Annual Operations and Maintenance Expenses (Excluding Depreciation)	_____ 103
• Annual Debt Service (Principal and Interest)	_____ 104
*Subtotal* (Line 103 + Line 104)	_____ 105
<b>Total Current and Projected WWT and CSO Costs (Line 102 + Line 105)</b>	_____ 106
<b>Residential Share of Total WWT and CSO Costs</b>	_____ 107
<b>Total number of Households in Service Area</b>	_____ 108
<b>Cost Per Household (Line 107 ÷ Line 108)</b>	_____ 109

## Developing the MHI Estimate

The second step in developing the Residential Indicator is to determine the adjusted median household income (MHI) for the permittee's entire wastewater service area. Information and calculations used to develop the adjusted MHI value are presented in Worksheet 2 and its instructions.

### Worksheet 2 Instructions

Enter the requested information on Worksheet 2, lines 201 through 203. MHI from the latest census year should be adjusted to current year dollars with the average CPI inflation rate from the latest census year to the current year using the following formula.

$$\text{Adjusted MHI} = \text{MHI} \times \text{Adjustment Factor}$$

The MHI adjustment factor can be calculated using the following formula or the inflation adjustment factor from the table on page 58:

$$\text{MHI Adjustment Factor} = (1 + \text{CPI})^{\text{Current Year} - \text{Census Year}}$$

For example, if a permittee's MHI was \$30,000 in the 1990 census year, the average annual CPI since 1990 was 4 percent and the current year is 1992, the following calculation would be made to adjust the MHI to current dollars:

$$\text{Adjustment Factor} = (1 + .04)^{1992 - 1990} = 1.0816$$

$$\text{Adjusted MHI} = \$30,000 \times 1.0816 = \$32,448$$

On Worksheet 2, calculate the adjusted MHI by entering the latest census MHI value on line 201. Then enter the MHI Adjustment Factor on line 202. Finally, multiply the MHI (line 201) by the Adjustment Factor (line 202) and enter the Adjusted MHI on line 203.

**RESIDENTIAL INDICATOR  
Worksheet 2**

Median Household Income (MHI)	<u>Line Number</u>
• Census Year MHI _____	201
• MHI Adjustment Factor _____	202
• Adjusted MHI (Line 201 x Line 202) _____	203
 Annual WWT and CSO Control Cost Per Household (CPH) (Line 109) _____	 204
 Residential Indicator:	
 Annual Wastewater and CSO Control Costs per Household as a percent of Adjusted Median Household Income (CPH as % MHI) (Line 204 ÷ Line 203 x 100) _____	    205

If the permittee's service area includes more than one jurisdiction, it may be necessary to develop a weighted MHI for the entire service area. The Bureau of Census's designated MHI areas generally encompass most permittees' service areas. For this reason, the calculation of a weighted MHI usually will not be necessary to reasonably represent the permittee's MHI. When a weighted MHI must be acquired, a weight would be assigned to each jurisdiction to reflect its share of the total households.

The following example illustrates how to develop a weighted MHI value before adjusting it to current year dollars. If a permittee is a regional authority that serves three local jurisdictions, the weighted average MHI would be calculated as follows:

<u>Jurisdiction</u>	<u>MHI</u>	<u>Number of Households (HH)</u>
A	\$30,000	100,000
B	\$45,000	25,000
C	\$25,000	50,000
		175,000

$$\begin{aligned}
 \text{Weighted MHI} &= MHI_A \left( \frac{HH_A}{\text{Total HH}} \right) + MHI_B \left( \frac{HH_B}{\text{Total HH}} \right) + MHI_C \left( \frac{HH_C}{\text{Total HH}} \right) \\
 &= \$30,000 \left( \frac{100,000}{175,000} \right) + \$45,000 \left( \frac{25,000}{175,000} \right) + \$25,000 \left( \frac{50,000}{175,000} \right) \\
 &= \$17,143 + \$6,429 + \$7,143 \\
 &= \$30,715
 \end{aligned}$$

**Data Sources**

Median household income is available for most communities from the latest census. In the few cases where a local jurisdiction's MHI is not available, the surrounding county's MHI may be sufficient. Each state has a state data center that serves as a local source of census data for public use. This center may be contacted to obtain the information available from the Bureau of Census for use during this assessment (see Appendix B).

## Developing the Residential Indicator

### Worksheet 2 Instructions

To calculate the Residential Indicator (line 205 of Worksheet 2), divide the annual WWT and CSO control cost per household (line 109 transferred to line 204) by the Adjusted MHI (line 203) and multiply by 100.

## Analyzing the Residential Indicator

The Residential Indicator will be used in the Financial Capability Matrix in Section IV to help permittees, and EPA and state NPDES authorities determine reasonable and workable long-term CSO control schedules. (The Residential Indicator does not provide special recognition for low income groups since their influence is automatically reflected in the median household income component of the indicators.)

To assess the financial impact CSO controls may have on the permittee's residential users, the Residential Indicator is compared to the financial impact ranges that reflect EPA's previous experience with water pollution control programs. These ranges are as follows:

<b>Financial Impact</b>	<b>Residential Indicator (CPH as % MHI)</b>
Low	Less than 1.0 Percent of MHI
Mid-Range	1.0 - 2.0 Percent of MHI
High	Greater than 2.0 Percent of MHI

When the Residential Indicator is less than 1.0 percent, between 1.0 and 2.0 percent, and greater than 2.0 percent, the financial impact on residential users to implement the CSO controls will be characterized as "low," "mid-range," and "high," respectively. Unless there are significant weaknesses in a permittee's financial and socioeconomic conditions, second phase reviews for permittees that have a low residential indicator score (less than 1.0) are unlikely to result in longer implementation schedules. Permittees with low residential indicators may wish to forego the second phase analysis and proceed with the normal engineering and construction implementation schedule developed as part of the CSO planning process.

In situations where a permittee believes that there are unique circumstances that would affect the conclusion of the first phase, the permittee may submit documentation of its unique financial conditions to the appropriate state NPDES and EPA authorities for consideration.

## **IV. PHASE TWO: PERMITTEE FINANCIAL CAPABILITY INDICATORS**

In the second phase, selected indicators are assessed to evaluate the financial capability of the permittee. These indicators will examine the permittee's debt burden, socioeconomic conditions, and financial operations. The second-phase review examines three general categories of financial capability indicators for the permittee:

- **Debt Indicators** - Assess current debt burden of the permittee or the communities within the permittee's service area and their ability to issue additional debt to finance the CSO controls. The indicators selected for this purpose are:
  - Bond Ratings (General Obligation and/or Revenue Bond Fund)
  - Overall Net Debt as a Percent of Full Market Property Value
- **Socioeconomic Indicators** - Assess the general economic well-being of residential users in the permittee's service area. The indicators selected for this purpose are:
  - Unemployment Rate
  - Median Household Income
- **Financial Management Indicators** - Evaluate the permittee's overall ability to manage financial operations. The indicators selected for this purpose are:
  - Property Tax Revenue Collection Rate
  - Property Tax Revenues as a Percent of Full Market Property Value

Even though the financial capability analysis reflects current conditions, pending changes in the service area should be considered in development of the second phase indicators. For example, if the current unemployment rate is high, but there is a new plant opening that will stimulate economic growth, the unemployment indicators for the service area would need to be modified to reflect the projected impact of the new plant. The permittee should submit documentation of such conditions to the appropriate EPA and state NPDES authorities for consideration. When the permittee is a sanitary district, sewer authority or similar entity, the second phase indicators related to property values and tax revenues may not be applicable. In those circumstances, the permittee may simply use the remaining indicators or submit other related documentation that will help assess its financial capability to implement the CSO controls.

## DEBT INDICATORS

The debt indicators described below were selected to assess the current debt burden conditions and the ability to issue new debt. These indicators are the bond rating and overall net debt as a percent of full market property value. When these indicators are not available for the permittee, other financial data which illustrates debt burden and debt issuing capacity may be used to assess the permittee's financial capability in this area.

### Bond Rating

The information needed to evaluate the bond ratings is presented in Worksheet 3. Recent bond ratings for the permittee and service area communities summarize a bond rating agency's assessment of a permittee's or community's credit capacity. General obligation (G.O.) bonds are bonds issued by a local government and repaid with taxes (usually property taxes). They are the primary long-term debt funding mechanism in use by local governments. General obligation bond ratings reflect financial and socioeconomic conditions experienced by the community as a whole.

"Revenue bond" ratings, by comparison, reflect the financial conditions and management capability of the wastewater utility. They are repaid with revenues generated from user fees. Revenue bonds are sometimes referred to as water or sewer bonds. In some cases these bonds may have been issued by the state on behalf of local communities. (Additional information on bonds is contained in EPA's Combined Sewer Overflows—Guidance For Funding Options (EPA 832-B-95-007 ).

Bond ratings normally incorporate an analysis of many financial capability indicators. These analyses evaluate the long term trends and current conditions for the indicators. The ultimate bond ratings reflect a general assessment of the current financial conditions. However, if security enhancements like bond insurance have been used for a revenue bond issue, the bond rating may be higher than justified by the local conditions.

Many small and medium-sized communities and permittees have not used debt financing for projects and, as a result, have no bond rating. The absence of bond rating does not indicate strong or weak financial health. When a bond rating is not available, this indicator may be excluded from the financial analysis.

### Worksheet 3 Instructions

Enter the most recent bond ratings on Worksheet 3, lines 301 and 302. Note that ratings are requested for general obligation bonds and revenue bonds. When there are several different bond ratings, enter the most recent bond rating on Line 303 as the summary bond rating.

### Data Sources

Municipal bond reports from rating agencies (e.g., Moody's Bond Record, Standard & Poor's Corporation) provide recent ratings.

### Benchmarks

#### Moody's Investor Services

"Baa" is the minimum investment grade rating. See *Moody's on Municipals - an Introduction to Issuing Debt* for a description of bond ratings.

#### Moody's Investor Services' Ratings

- Weak: Ba, B, Caa, Ca, C
- Mid-Range: Baa
- Strong: Aaa, AA, A

#### Standard & Poor's

"BBB" is the minimum investment grade rating. See *Standard & Poor's Municipal Finance Criteria* for a description of bond ratings.

#### Standard and Poor's Ratings

- Weak: BB, B, CCC, CC, C, D
- Mid-Range: BBB
- Strong: AAA, AA, A

**BOND RATING  
Worksheet 3**

Line Number

- Most Recent General Obligation Bond Rating \_\_\_\_\_  
Date: \_\_\_\_\_  
Rating Agency: \_\_\_\_\_  
Rating: \_\_\_\_\_ 301
  
- Most Recent Revenue (Water/Sewer or Sewer) Bond  
Date: \_\_\_\_\_  
Rating Agency: \_\_\_\_\_  
Bond Insurance (Yes/No) \_\_\_\_\_  
Rating: \_\_\_\_\_ 302  
Summary Bond Rating: \_\_\_\_\_ 303

## Overall Net Debt as a Percent of Full Market Property Value

### Description

Overall net debt is debt repaid by property taxes in the permittee's service area. It excludes debt which is repaid by special user fees (e.g., revenue debt). This indicator provides a measure of the debt burden on residents within the permittee's service area and measures the ability of local governmental jurisdictions to issue additional debt. It includes the debt issued directly by the local jurisdiction and debt of overlapping entities, such as school districts. This indicator compares the level of debt owed by the service area population with the full market value of real property used to support that debt and serves as a measure of financial wealth in the permittee's service area. Information needed to develop overall net debt as a percent of full market value is identified on Worksheet 4.

### Worksheet 4 Instructions

Enter requested data on Worksheet 4, lines 401 - 405.

**Line 401 - Direct Net Debt** - Enter the amount of each jurisdiction's general obligation debt outstanding that is supported by the property in the permittee's service area. General obligation bonds are secured by the "full faith and credit" of the community and are payable from general tax revenues. This debt amount excludes general obligation bonds that are payable from some dedicated user fees or specific revenue source other than the general tax revenues. These general obligation bonds are called "double-barreled bonds."

**Line 402 - Debt of Overlapping Entities** - Calculate the permittee's service area's share of any debt from overlapping entities using the process illustrated below.

1. Identify in Column A below each overlapping entity that has incurred debt that must be partially supported by the permittee's service area. (Check the State assessor's office for this information).
2. Identify the total amount of tax-supported outstanding debt for each overlapping entity in Column B. Money in a sinking fund is not included in the outstanding debt since it represents periodic deposits into an account to ensure the availability of sufficient monies to make timely debt service payments.
3. Identify the percentage of each overlapping entity's outstanding debt charged to persons or property in the permittee's service area in Column C. The percentage is based on the estimated full market value of real property of the respective jurisdictions.

4. Multiply the total outstanding debt of each overlapping entity by the percentage identified for the permittee's service area (Column B x C).
5. Add the figures in Column D to arrive at total overlapping debt for permittee's service area.

(A) Overlapping Entities	(B) Outstanding Debt (less Sinking Fund)	(C) Percent Chargeable to Permittee's Service Area	(D) Outstanding Debt Attributable to Permittee's Service Area
County	\$10,500,000	25%	\$2,625,000
School District	16,800,000	95%	15,960,000
Total Overlapping Debt			\$18,585,000

**Line 403 - Overall Net Debt - Add lines 401 and 402.**

**Line 404 - Market Value of Property -** The property value should reflect the full market value of property within the permittee's service area. It is possible that the tax assessed property value will not reflect full market value. This occurs when the tax assessment ratio is less than one. In such cases the full market value of property is computed by dividing the total tax assessment value by the assessment ratio (the assessment ratio represents the percentage of the full market value that is taxed at the established tax rate). For example, if the assessed value is \$1,000,000 and the assessment ratio is 50 percent then the full market value of real property is  $\$1,000,000 / .50 = \$2,000,000$ .

**Line 405 - Overall Net Debt as a Percent of Full Market Property Value - Divide line 403 by line 404 and multiply by 100.**

## Data Sources

Debt information is available from the financial statements of each community. In most cases the most recent financial statements are on file with the state (e.g., State Auditor's Office). Overlapping debt may or may not be provided in a community's financial statements. The property assessment data should be readily available through the community or the State's assessor office. The boundary of most permittees' service areas generally conforms to one or more community boundaries. Therefore, prorating community data to reflect specific service area boundaries is not normally necessary for evaluating the general financial capability of the permittee.

## Benchmarks

- Weak: Above 5%
- Mid-range: 2-5%
- Strong: Below 2%

**OVERALL NET DEBT AS A PERCENT OF FULL MARKET PROPERTY VALUE**  
**Worksheet 4**

	<u>Line Number</u>
• Direct Net Debt (G.O. Bonds Excluding Double- Barreled Bonds)	401
• Debt of Overlapping Entities (Proportionate Share of Multijurisdictional Debt)	402
• Overall Net Debt (Lines 401+402)	403
• Market Value of Property	404
• Overall Net Debt as a Percent of Full Market Property Value (Line 403 divided by Line 404 x 100)	405

## SOCIOECONOMIC INDICATORS

The socioeconomic indicators are used to assess the general economic well-being of residential users in the permittee's service area. The indicators used to assess economic conditions are unemployment rate and median household income. When the permittee has additional socioeconomic data, it may want to submit the data to the appropriate EPA and state NPDES authorities to facilitate a better understanding of the permittee's unique economic conditions. Several examples of this type of socioeconomic data could be poverty rate, population growth, and employment projections.

### Unemployment Rate

Unemployment information is entered on Worksheet 5. The unemployment rate is defined as the percent of a permittee's service area residents on the unemployment rolls.

#### Worksheet 5 Instructions

Unemployment values are entered on lines 501 - 503 on Worksheet 5. If the unemployment rate for a permittee's service area is not available, the unemployment rate for the county in which the service area is located may be used as a substitute. On line 503, enter the average national unemployment rate.

#### Data Sources

The Bureau of Labor Statistics (BLS) maintains current unemployment rate figures for municipalities and counties over 25,000 population. National and state unemployment data are also available for comparison purposes. This information can be obtained from the BLS by request at (202) 606-6392.

#### Benchmarks

Compare the permittee's unemployment values with the national average values. National averages are readily available through the Bureau of Labor Statistics.

- **Weak:** More than 1 percentage point above the National Average
- **Mid-range:**  $\pm$  1 percentage point of the National Average
- **Strong:** More than 1 percentage point below National Average

For example, if the national average unemployment rate is 6 percent, an unemployment rate greater than 7 percent would be considered weak, while an unemployment rate less than 5 percent would be considered strong.

**UNEMPLOYMENT RATE**  
**Worksheet 5**

	<u>Line Number</u>
• Unemployment Rate - Permittee _____	501
Source: _____	
• Unemployment Rate - County (use if permittee's rate is unavailable) _____	502
• Source: _____	
Benchmark:	
• Average National Unemployment Rate: _____	503
• Source: _____	

## Median Household Income

Median household income (MHI) is defined as the median amount of total income dollars received per household during a calendar year in a given area. It serves as an overall indicator of community earning capacity. Worksheet 6 is used to present information for this indicator.

### Worksheet 6 Instructions

Median household income was discussed during the first phase assessment and is presented on Worksheet 2. On line 601 of Worksheet 6, enter the adjusted MHI from Worksheet 2 (line 203). Use the MHI adjustment factor from Worksheet 2 (line 202) to calculate the adjusted national MHI from the latest census, national MHI value (line 602) and enter the value on Line 604.

### Data Sources

Median household income is available through state data centers. Refer to Worksheet 2 for MHI of the permittee's service area. Refer to Appendix B for the address and telephone number of the state's data center to acquire the latest census national MHI value.

### Benchmarks

Compare the permittee's MHI to the adjusted national MHI:

- **Weak:** More than 25% below Adjusted National MHI
- **Mid-Range:**  $\pm$  25% of the Adjusted National MHI
- **Strong:** More than 25% above Adjusted National MHI

**MEDIAN HOUSEHOLD INCOME**  
**Worksheet 6**

	<u>Line Number</u>
• Median Household Income - Permittee (Line 203) _____	601
• Source: _____	
Benchmark:	
• Census Year National MHI _____	602
• MHI Adjustment Factor (line 202) _____	603
• Adjusted National MHI: (line 602 x line 603) _____	604
• Source: _____	

## FINANCIAL MANAGEMENT INDICATORS

The financial management indicators used to evaluate a permittee's financial management ability are property tax revenue as a percent of full market value of real property and property tax revenue collection rate.

### Property Tax Revenues as a Percent of Full Market Property Value

This indicator can be referred to as the "property tax burden" since it indicates the funding capacity available to support debt based on the wealth of the community. It also reflects the effectiveness of management in providing community services.

#### Worksheet 7 Instructions

Property tax burden is computed on Worksheet 7. The full market value of real property was calculated in Worksheet 4, line 404. Enter the full market value on line 701. Enter the most recent year's property tax revenue on line 702. General fund revenues are primarily property tax receipts.

#### Data Sources

The property assessment data should be readily available through the community or the State's assessor office (see Worksheet 4, Line 404). Property tax revenues are available in communities' annual financial statements. Occasionally, the assessment and tax revenue data of communities partially serviced by the permittee may have to be prorated to provide a clearer picture of the permittee's property tax burden.

#### Benchmarks

- Weak: Above 4%
- Mid-range: 2%-4%
- Strong: Below 2%.

**PROPERTY TAX REVENUES AS A PERCENT OF FULL MARKET PROPERTY  
VALUE  
Worksheet 7**

	<u>Line Number</u>
• Full Market Value of Real Property (Line 404) _____	701
• Property Tax Revenues _____	702
• Property Tax Revenue as a Percent of Full Market Property Value (702 ÷ 701 x 100) _____	703

## Property Tax Revenue Collection Rate

The property tax revenue collection rate is an indicator of the efficiency of the tax collection system and the acceptability of tax levels to residents.

### Worksheet 8 Instructions

The property tax revenue collection rate is calculated on Worksheet 8. The property tax revenues collected was listed in Worksheet 7, Line 702. Enter this value on line 801. Enter the property taxes levied on line 802. Divide the property tax revenue collected by the property taxes levied and multiply by 100 to present the collection rate as a percentage on line 803.

### Data Sources

Property taxes levied can be computed by multiplying the assessed value of real property by the property tax rate, both of which are available from a community's financial statements or the state assessor's office (see Worksheet 4, Line 404). Property tax revenues are available in communities' annual financial statements. Occasionally, the assessment and tax revenue data of communities partially serviced by the permittee may have to be prorated to provide a clearer picture of the permittee's property tax revenue collection rate.

### Benchmarks

- Weak: Below 94%
- Mid-range: 94-98%
- Strong: Above 98%.

**PROPERTY TAX REVENUE COLLECTION RATE**  
**Worksheet 8**

	<u>Line Number</u>
• Property Tax Revenue Collected (Line 702) _____	801
• Property Taxes Levied _____	802
• Property Tax Revenue Collection Rate (line 801 ÷ line 802 x 100) _____	803

## Analyzing Permittee Financial Capability Indicators

This section describes how the indicators in the second phase may be used to generate an overall score of a permittee's financial capability. The indicators are compared to national benchmarks to form an overall assessment of the permittee's financial capability and its effect on implementation schedules in the long-term CSO control plan.

In situations where a permittee believes that there are unique circumstances that would affect the conclusion of the second phase, the permittee may submit documentation of its unique financial conditions to the appropriate EPA and state NPDES authorities for consideration. The purpose of additional information is to clarify unique circumstances which are not fairly represented by the overall scores of the selected indicators. An example could be where a state or community imposes restrictions on property taxes.

### Worksheet 9 Instructions

The indicators generated from the worksheets are compared to the state, national or industry benchmarks presented in Table 2. Information compiled from Worksheets 3 through 8 is summarized in Column A on Worksheet 9. Score each of these values using the rating standards in Table 2 and the following score benchmarks and enter the appropriate number in Column B. The score definitions are:

<u>Benchmarks</u>	<u>Score</u>
• Weak	1
• Mid-Range	2
• Strong	3

To calculate an average score for the indicators, total the values in Column B and divide by the number of entries. Enter the average score on Line 907.

If it is not possible to develop one or more of the six indicators, the permittee should explain why the indicator is inappropriate or unavailable. Since the point of the analysis is to measure the overall financial burden of the CSO controls, the debt and socioeconomic indicators are generally better measures of this burden than the financial management indicators. Consequently, if one of the debt or socioeconomic indicators is not available, the two financial management indicators should be averaged and used as a single indicator to average with the available debt and socioeconomic indicators. This averaging is necessary so that undue weight is not given to the financial management indicators.

**PERMITTEE FINANCIAL CAPABILITY INDICATOR BENCHMARKS**

**Table 2**

<b>Indicator</b>	<b>Strong</b>	<b>Mid-Range</b>	<b>Weak</b>
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) Baa (Moody's)	BB-D (S&P) Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% - 5%	Above 5%
Unemployment Rate	More than 1 Percentage Point Below the National Average	± 1 Percentage Point of National Average	More than 1 Percentage Point Above the National Average
Median Household Income	More than 25% Above Adjusted National MHI	±25% of Adjusted National MHI	More than 25% Below Adjusted National MHI
Property Tax Revenues as a Percent of Full Market Property Value	Below 2%	2% - 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% - 98%	Below 94%

**SUMMARY OF PERMITTEE FINANCIAL CAPABILITY INDICATORS**  
Worksheet 9

<u>Indicator</u>	<u>Column A: Actual Value</u>	<u>Column B: Score</u>	<u>Line Number</u>
Bond Rating (Line 303)	_____	_____	901
Overall Net Debt as a Percent of Full Market Property Value (Line 405)	_____	_____	902
Unemployment Rate (Line 501)	_____	_____	903
Median Household Income (Line 601)	_____	_____	904
Property Tax Revenues as a Percent of Full Market Property Value (Line 703)	_____	_____	905
Property Tax Revenue Collection Rate (Line 803)	_____	_____	906
Permittee Indicators Score (Sum of Column B ÷ Number of Entries)		_____	907

## **The Financial Capability Matrix**

The results of the Residential Indicator and the Permittee Financial Capability Indicators analyses are combined in the Financial Capability Matrix to evaluate the level of financial burden the CSO controls may impose on a permittee. This matrix can be used by permittees, EPA and state NPDES authorities to establish reasonable and workable CSO control implementation schedules.

### Worksheet 10 Instructions

First, enter the value of the Residential Indicator (Cost Per Household as a % of MHI) from Line 205 (Worksheet 2) on Line 1001 of Worksheet 10. Enter the Permittee Financial Capability Indicators score from Line 907 (Worksheet 9) on Line 1002. With this information, find the financial burden category for the permittee in the Financial Impact Matrix (Table 3). Enter the category on line 1003.

For example, if the Residential Indicator from Line 1001 is 1.3% and the Permittee Financial Capability Indicators score from Line 1002 is 2.1, the Financial Capability Matrix would indicate that implementation of the CSO control would be "Medium Burden" for the permittee.

The result from the Financial Capability Matrix is used to develop a CSO implementation schedule as described in Section V: CSO Schedule Development.

**FINANCIAL CAPABILITY MATRIX SCORE**  
**Worksheet 10**

	<u>Line Number</u>
• Residential Indicator Score (Line 205) _____	1001
• Permittee Financial Capability Indicators Score (Line 907) _____	1002
• Financial Capability Matrix Category (see matrix next page) _____	1003

**FINANCIAL CAPABILITY MATRIX**  
**Table 3**

<b>Permittee                      Financial                      Capability                      Indicators Score</b> (Socioeconomic, Debt and Financial Indicators)	<b>Residential Indicator</b> (Cost Per Household as a % of MHI)		
	Low (Below 1.0 %)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0 %)
<b>Weak</b> (Below 1.5)	Medium Burden	High Burden	High Burden
<b>Mid-Range</b> (Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
<b>Strong</b> (Above 2.5)	Low Burden	Low Burden	Medium Burden

## V. CSO SCHEDULE DEVELOPMENT

The CSO Policy recognizes that the causes and impacts of CSOs are site-specific water pollution control problems. Identification of CSO controls involves evaluation of significant technical, environmental, and financial issues. Therefore, the CSO Policy provides an opportunity for flexible, phased implementation of CSO controls to achieve compliance with the technology-based and water quality based requirements of the Clean Water Act.

Under the CSO Policy, permittees with combined sewer systems are expected to implement the nine minimum CSO controls as expeditiously as possible but no later than January 1, 1997. The nine minimum controls are technology-based controls that can reduce the magnitude, duration, and frequency of CSOs and their effects on receiving waters (See guidance: *Combined Sewer Overflows—Guidance for Nine Minimum Controls* (EPA, 832-B-95-003)). These minimum controls are not intended to require significant engineering activities or major construction.

Permittees with combined sewer systems are also expected to develop long-term control plans (LTCPs) that include provisions for public participation, monitoring of CSOs and their impacts, evaluation and selection of control alternatives, and implementation schedules for long-term controls. A permittee is expected to develop its LTCP as soon as practicable, but generally within two years after a requirement to develop an LTCP has been specified in its NPDES permit or other enforceable mechanism. The development and implementation of an LTCP will be coordinated with implementation of the nine minimum controls. Development of the LTCP involves negotiations with the EPA and state NPDES authorities and if appropriate, state WQS authorities. Among other components the LTCP contains fixed-date implementation and financing schedules to design and construct the needed CSO controls.

The CSO Policy recognizes the need to address the relative importance of environmental and financial issues when developing an implementation schedule for CSO controls to be contained in the LTCP and the NPDES permit or other enforceable mechanism. According to the CSO Policy, an implementation schedule “may be phased based on the relative importance of adverse impacts on WQS and designated uses, priority projects identified in the long-term plan, and on a permittee’s financial capability.” The CSO Policy identifies the following environmental and financial considerations that may affect the phasing of an implementation schedule for CSO controls:

- Eliminating overflows to sensitive areas
- Use impairment
- Financial capability
- Grant and loan availability
- Previous and current sewer user fees and rate structures

- Other viable funding mechanisms and sources of financing.

These factors, may warrant phasing the CSO control implementation schedules in a manner other than would be prescribed by logical engineering sequencing and normal construction practices. This section illustrates how these considerations may affect scheduling and provides some general scheduling boundaries to aid all parties in negotiating the final implementation schedule for CSO controls.

Scheduling is first considered during the permittee's development of an LTCP. The LTCP should assess CSO control alternatives including estimated design and construction time requirements for various components of the CSO controls. In general, CSO controls should be implemented as expeditiously as possible.

The permittee should first develop a tentative implementation schedule based on logical engineering sequencing and normal construction practices. The permittee should complete a critical path analysis to identify the shortest implementation schedule that will achieve the control objectives identified in the LTCP (See guidance: *Combined Sewer Overflows-Guidance for Long-term Control Plan (EPA 832-13-95-002)*). As a result of negotiations with state NPDES and EPA authorities, it may be appropriate to modify the tentative design and construction schedule based on the environmental and financial considerations listed above.

In general, the final negotiated schedule for CSO controls would reflect two types of modifications to the engineering and construction schedule. First, where CSOs discharge to sensitive or significantly use-impaired water bodies, the final schedule would provide for expedited implementation of the controls for these discharges. Second, the schedules may be phased or extended to reflect the significance of various financial considerations, particularly financial capability. The number of years to implement the CSO controls would be negotiated between the permittee, EPA and state NPDES authorities.

The following discussion provides more information on environmental and financial considerations that affect implementation schedules for CSO controls.

## ENVIRONMENTAL CONSIDERATIONS

### Discharges to Sensitive Areas

The CSO Control Policy states that a permittee's LTCP should give the highest priority to "sensitive areas." Sensitive areas are identified by the NPDES permitting authorities. They include the following:

- Outstanding National Resource Waters
- National Marine Sanctuaries
- Waters with threatened or endangered species and their habitat
- Waters with primary contact recreation
- Public drinking water intakes or their designated protection areas
- Shellfish beds.

For discharges to sensitive areas, the CSO Control Policy provides the following approaches:

- Prohibit new or significantly increased overflows
- Eliminate or relocate overflows
- Where elimination or relocation is not feasible, provide treatment to meet WQS and regularly reassess the feasibility of prohibition, elimination, or relocation.

During the planning process the permittee should characterize existing CSO conditions and identify receiving waters that are sensitive areas. The LTCP should give priority to sensitive areas and any implementation schedule should sequence projects to mitigate impacts on sensitive areas as early as possible. Giving high priority to sensitive areas might mean in some cases that discharges to non-sensitive areas would be addressed later in the implementation schedule than would be the case under a normal engineering and construction schedule.

### Use Impairment

Long-term control plans should also give priority to receiving waters that experience recurring adverse impacts from CSOs on aquatic life, human health or aesthetics. Such waters may be the subject of public or media concern.

As a result of public participation and discussion with the permitting authority, the permittee should develop an implementation schedule that gives high priority to waters with impaired uses

and addresses them as soon as possible. As was the case for sensitive areas, giving high priority to certain use-impaired waters might mean that discharges to other waters would be addressed later in the implementation schedule than would be the case under a normal engineering and construction schedule.

The EPA document *Combined Sewer Overflows—Guidance for Screening and Ranking* (EPA-832-B-95-004) can provide assistance in identifying which CSO discharge points are likely to have the greatest adverse impact on water quality, aquatic life, or human health.

## PRIMARY FINANCIAL CONSIDERATIONS

### Financial Capability

The CSO Control Policy recognizes that financial capability is a significant factor in schedule development. A permittee's financial capability is assessed according to where the permittee falls on the Financial Capability Matrix calculated in worksheet 10. The matrix characterizes the financial burden on the permittee to implement CSO controls as either "Low Burden," "Medium Burden," or "High Burden."

To aid permittees, and EPA and state NPDES authorities during the negotiations necessary to establish implementation schedules for CSO controls, general time periods are presented in Table 4 that correspond with the permittee's Financial Capability Matrix Score summarized in Worksheet 10. The general implementation schedule time boundaries provide a basis for developing consistent and reasonably uniform implementation schedules across the nation in situations where permittee's CSO controls impose similar financial burdens. The time boundaries are not intended to replace the negotiations and deliberations necessary to balance all of the environmental and financial considerations that influence the site specific nature of the controls and implementation schedules.

### FINANCIAL CAPABILITY GENERAL SCHEDULING BOUNDARIES

**Table 4**

Financial Capability Matrix Category	Implementation Period
Low Burden	Normal Engineering/Construction
Medium Burden	Up to 10 years
High Burden	Up to 15 Years*
	*(Schedule up to 20 years based on negotiation with EPA and state NPDES authorities)

Generally, a permittee in the "Low Burden" category would be expected to implement CSO control projects based on a normal engineering and construction schedule. In all cases, discharge to sensitive areas and impaired waters would be addressed on a high priority basis.

For permittees in the "Medium Burden" category, an implementation schedule up to 10 years might be appropriate. A permittee in the "High Burden" category is likely to incur substantial financial impacts to implement CSO controls; in such cases, an implementation schedule up to 15 years might be appropriate. In unusually "High Burden" situations, an implementation schedule up to 20 years may be negotiated with state NPDES and EPA authorities.

## SECONDARY FINANCIAL CONSIDERATIONS

The three financial considerations--grant and loan availability, sewer user fees, and other viable funding mechanisms--are normally investigated early in the process of establishing CSO controls. They are described in more detail in the EPA document *Combined Sewer Overflows—Guidance for Funding Options* (EPA-832-B-95-007). They are typically addressed and resolved in the development of the financial schedule for the LTCP prior to design and construction. Therefore, these considerations normally do not have a significant impact on the length of time needed to implement CSO controls. An exception could occur in a case where a permittee's CSO controls can be constructed quickly but where the only available CSO funding source takes an inordinately long time to implement.

### Grant and Loan Availability

During the long-term planning process, the permittee should develop a financing plan that identifies sources of capital funds. Generally, these will include some form of loan or grant. Typically, availability of grants and loans will not have a significant impact on the implementation schedule. In evaluating the effect of grant and loan availability on the permittee's schedule, the following funding sources would be considered:

- State wastewater treatment grant programs
- SRF Program
- State loan program (other than SRF program)
- Rural Utility Services Program (formerly: Rural Development Administration loan program)
- CoBank loan program
- Commercial loans
- Local revenue bonds
- Local general obligation bonds

## **Sewer User Fees**

As part of the long-term planning process, the permittee should identify existing user fees and rate structures for wastewater treatment and then develop a new rate structure that includes recovery of the costs for CSO controls. Depending upon how CSO user fees are apportioned among residential, commercial, and industrial users, implementation of the LTCP may cause fees to increase significantly. In most cases, construction of the CSO controls occurs over an extended period allowing time for an orderly increase in the user fees. Thus, user fees typically are unlikely to have a significant impact on the implementation schedule. Combining increases in user fees with an ongoing public education program can help ease the effects of “rate shock” related to the higher user fees. The EPA document “Building Support for Increasing User Fees,” (EPA 430/09-89-006) provides specific details on creating a public education program to successfully raise user fees.

## **Other Viable Funding Mechanisms and Sources of Funding**

The permittee may have to consider alternate sources of funding if loans and grants are not available or if a need exists to reduce the financial impact of CSO controls on the users. In some cases, alternative funding mechanisms or financing sources may require additional time to set up. To evaluate the scheduling impacts of other viable funding mechanisms and sources of financing, the permittee’s ability to accomplish the following actions would be assessed:

- Establish special assessment districts
- Increase user fees
- Impose/increase taxes (such as income taxes, sales taxes, or property taxes)
- Privatize wastewater treatment.

Most permittees would be expected to have several of these options available; therefore other viable funding mechanisms and sources of funding typically are not likely to have a significant impact on the implementation schedule.

## **SCHEDULING CONSIDERATIONS**

Establishing an implementation schedule for the CSO controls is a negotiating process involving the permittee and EPA and state NPDES authorities. Normally, the time period for the CSO control implementation schedule is defined by the time required for normal engineering and construction practices. However, environmental and financial considerations can influence the time allowed to complete the CSO controls. The implementation schedule would always give high priority to addressing the environmental considerations involving discharges to sensitive areas and use-impaired water bodies. The CSO controls for these discharges would be constructed as expeditiously as possible. The implementation schedule can lengthen by phasing construction of the CSO controls when financial considerations create a financial burden. The primary financial

consideration which usually results in an extended implementation schedule with phased construction is the financial capability consideration.

Application of environmental and financial considerations to the development of implementation schedules for three hypothetical permittees is presented in Table 5.

Permittee number 1 required an eight year normal engineering/construction schedule to implement the CSO controls. Negotiations between the permittee and EPA and the state NPDES authorities resulted in agreement that four years would be allowed for the special circumstances of the permittee's low-burden financial capability category. Therefore, the eight-year engineering schedule took precedence over the financial consideration (therefore were no environmental considerations), and the schedule for implementation of CSO controls was eight years.

Permittee number 2 required three years to implement long-term controls under a normal engineering/construction schedule. Negotiations with the NPDES and WQS authorities concluded that four years would be necessary to obtain SRF loans. A four-year implementation schedule for CSO controls was established by the NPDES permitting authority to accommodate the most time consuming funding option.

Implementation of permittee number 3's CSO controls required a six-year normal engineering/construction schedule. However, the following environmental and financial considerations affected the final schedule:

- One of the permittee's CSO outfalls discharges to a bathing beach. Bathing beaches are defined as sensitive areas in the CSO Control Policy. Although a normal engineering/construction schedule would have eliminated this outfall in four years, it was determined that the schedule could be modified to eliminate this outfall in two years.
- The permittee's cost per household as percent of median household income is 2.2 percent, yielding a Residential Indicator of "Weak." The other socioeconomic, debt, and financial indicators yield a Permittee Indicators score of 1.7, or "Mid-Range." According to Table 3, these two indicators place the permittee in the "High-Burden" category for financial capability.
- User fees will have to increase significantly.

The unusual nature of permittee number 3's "high burden" financial capability category resulted in a sixteen-year schedule for this financial consideration after negotiations with the EPA and state NPDES authorities. Therefore, the permittee would receive a sixteen-year schedule to implement all CSO controls, with a special requirement that the CSO discharge to the bathing beaches be removed in the first two years of the schedule.

It is important to note that the final CSO control implementation schedule established for each permittee should be a time period that is negotiated between the permittee and EPA and state NPDES authorities based on the specific circumstances of each permittee's environmental and financial situation, plus the specific nature of any engineering and construction requirements.

**SCHEDULING CONSIDERATION FOR HYPOTHETICAL PERMITTEES**

**Table 5**

<b>Scheduling Consideration</b>	<b>Permittee #1</b>	<b>Permittee #2</b>	<b>Permittee #3</b>
Engineering/ Construction Schedule	8 years	3 years	6 years
Sensitive Areas	n/a	n/a	2 years to remove discharges from sensitive areas
Use Impairment	n/a	n/a	16 years
Financial Capability	4 years	0 years	0 years
Grant/Loan Availability	0 years	4 years	0 years
User fees/rate Structures	0 years	0 years	0 years
Other Funding Mechanisms	0 years	0 years	0 years
Schedule:	8 years	4 years	16 years (removal of discharge from sensitive area would occur within first 2 years)

**The time periods presented in this guidance should be viewed as general boundaries to aid all parties in establishing reasonable and effective CSO control implementation schedules.**

It is important to note that the final CSO control implementation schedule established for each permittee should be a time period that is negotiated between the permittee and EPA and state NPDES authorities based on the specific circumstances of each permittee's environmental and financial situation, plus the specific nature of any engineering and construction requirements. The time periods presented in this guidance should be viewed as general boundaries to aid all parties in establishing reasonable and effective CSO control implementation schedules.

## ACRONYM LIST

CPH	Cost Per Household
CPI	Consumer Price Index
CSS	Combined Sewer System
CSO	Combined Sewer Overflow
CWA	Clean Water Act
EPA	Environmental Protection Agency
LTCP	Long Term Control Plan
MHI	Median Household Income
NMC	Nine Minimum Controls
NPDES	National Pollutant Discharge Elimination System
SRF	State Revolving Fund
WQS	Water Quality Standards
WWT	Wastewater Treatment

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## Present Value Factors

Years	Interest Rate														
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783	0.769	0.756
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693	0.675	0.658
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613	0.592	0.572
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543	0.519	0.497
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480	0.456	0.432
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425	0.400	0.376
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376	0.351	0.327
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361	0.333	0.308	0.284
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295	0.270	0.247
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287	0.261	0.237	0.215
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231	0.208	0.187
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229	0.204	0.182	0.163
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205	0.181	0.160	0.141
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.160	0.140	0.123
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141	0.123	0.107
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146	0.125	0.108	0.093
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130	0.111	0.095	0.081
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116	0.098	0.083	0.070
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087	0.073	0.061
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059	0.047	0.038	0.030
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033	0.026	0.020	0.015

## Annualization Factors

Year	Interest Rate											
	0.005	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06
1	1.0050	1.0100	1.0150	1.0200	1.0250	1.0300	1.0350	1.0400	1.0450	1.0500	1.0550	1.0600
2	0.5038	0.5075	0.5113	0.5150	0.5188	0.5226	0.5264	0.5302	0.5340	0.5378	0.5416	0.5454
3	0.3367	0.3400	0.3434	0.3468	0.3501	0.3535	0.3569	0.3603	0.3638	0.3672	0.3707	0.3741
4	0.2531	0.2563	0.2594	0.2626	0.2658	0.2690	0.2723	0.2755	0.2787	0.2820	0.2853	0.2886
5	0.2030	0.2060	0.2091	0.2122	0.2152	0.2184	0.2215	0.2246	0.2278	0.2310	0.2342	0.2374
6	0.1696	0.1725	0.1755	0.1785	0.1815	0.1846	0.1877	0.1908	0.1939	0.1970	0.2002	0.2034
7	0.1457	0.1486	0.1516	0.1545	0.1575	0.1605	0.1635	0.1666	0.1697	0.1728	0.1760	0.1791
8	0.1278	0.1307	0.1336	0.1365	0.1395	0.1425	0.1455	0.1485	0.1516	0.1547	0.1579	0.1610
9	0.1139	0.1167	0.1196	0.1225	0.1255	0.1284	0.1314	0.1345	0.1376	0.1407	0.1438	0.1470
10	0.1028	0.1056	0.1084	0.1113	0.1143	0.1172	0.1202	0.1233	0.1264	0.1295	0.1327	0.1359
11	0.0937	0.0965	0.0993	0.1022	0.1051	0.1081	0.1111	0.1141	0.1172	0.1204	0.1236	0.1268
12	0.0861	0.0888	0.0917	0.0946	0.0975	0.1005	0.1035	0.1066	0.1097	0.1128	0.1160	0.1193
13	0.0796	0.0824	0.0852	0.0881	0.0910	0.0940	0.0971	0.1001	0.1033	0.1065	0.1097	0.1130
14	0.0741	0.0769	0.0797	0.0826	0.0855	0.0885	0.0916	0.0947	0.0978	0.1010	0.1043	0.1076
15	0.0694	0.0721	0.0749	0.0778	0.0808	0.0838	0.0868	0.0899	0.0931	0.0963	0.0996	0.1030
16	0.0652	0.0679	0.0708	0.0737	0.0766	0.0796	0.0827	0.0858	0.0890	0.0923	0.0956	0.0990
17	0.0615	0.0643	0.0671	0.0700	0.0729	0.0760	0.0790	0.0822	0.0854	0.0887	0.0920	0.0954
18	0.0582	0.0610	0.0638	0.0667	0.0697	0.0727	0.0758	0.0790	0.0822	0.0855	0.0889	0.0924
19	0.0553	0.0581	0.0609	0.0638	0.0668	0.0698	0.0729	0.0761	0.0794	0.0827	0.0862	0.0896
20	0.0527	0.0554	0.0582	0.0612	0.0641	0.0672	0.0704	0.0736	0.0769	0.0802	0.0837	0.0872

## Annualization Factors

Year	Interest Rate											
	0.065	0.07	0.075	0.08	0.085	0.09	0.095	0.1	0.105	0.11	0.115	0.12
1	1.0650	1.0700	1.0750	1.0800	1.0850	1.0900	1.0950	1.1000	1.1050	1.1100	1.1150	1.1200
2	0.5493	0.5531	0.5569	0.5608	0.5646	0.5685	0.5723	0.5762	0.5801	0.5839	0.5878	0.5917
3	0.3776	0.3811	0.3845	0.3880	0.3915	0.3951	0.3986	0.4021	0.4057	0.4092	0.4128	0.4163
4	0.2919	0.2952	0.2986	0.3019	0.3053	0.3087	0.3121	0.3155	0.3189	0.3223	0.3258	0.3292
5	0.2406	0.2439	0.2472	0.2505	0.2538	0.2571	0.2604	0.2638	0.2672	0.2706	0.2740	0.2774
6	0.2066	0.2098	0.2130	0.2163	0.2196	0.2229	0.2263	0.2296	0.2330	0.2364	0.2398	0.2432
7	0.1823	0.1856	0.1888	0.1921	0.1954	0.1987	0.2020	0.2054	0.2088	0.2122	0.2157	0.2191
8	0.1642	0.1675	0.1707	0.1740	0.1773	0.1807	0.1840	0.1874	0.1909	0.1943	0.1978	0.2013
9	0.1502	0.1535	0.1568	0.1601	0.1634	0.1668	0.1702	0.1736	0.1771	0.1806	0.1841	0.1877
10	0.1391	0.1424	0.1457	0.1490	0.1524	0.1558	0.1593	0.1627	0.1663	0.1698	0.1734	0.1770
11	0.1301	0.1334	0.1367	0.1401	0.1435	0.1469	0.1504	0.1540	0.1575	0.1611	0.1648	0.1684
12	0.1226	0.1259	0.1293	0.1327	0.1362	0.1397	0.1432	0.1468	0.1504	0.1540	0.1577	0.1614
13	0.1163	0.1197	0.1231	0.1265	0.1300	0.1336	0.1372	0.1408	0.1444	0.1482	0.1519	0.1557
14	0.1109	0.1143	0.1178	0.1213	0.1248	0.1284	0.1321	0.1357	0.1395	0.1432	0.1470	0.1509
15	0.1064	0.1098	0.1133	0.1168	0.1204	0.1241	0.1277	0.1315	0.1352	0.1391	0.1429	0.1468
16	0.1024	0.1059	0.1094	0.1130	0.1166	0.1203	0.1240	0.1278	0.1316	0.1355	0.1394	0.1434
17	0.0989	0.1024	0.1060	0.1096	0.1133	0.1170	0.1208	0.1247	0.1285	0.1325	0.1364	0.1405
18	0.0959	0.0994	0.1030	0.1067	0.1104	0.1142	0.1180	0.1219	0.1259	0.1298	0.1339	0.1379
19	0.0932	0.0968	0.1004	0.1041	0.1079	0.1117	0.1156	0.1195	0.1235	0.1276	0.1316	0.1358
20	0.0908	0.0944	0.0981	0.1019	0.1057	0.1095	0.1135	0.1175	0.1215	0.1256	0.1297	0.1339

## Inflation Adjustment Factors

Years	Interest Rate														
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130	1.140	1.150
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277	1.300	1.323
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443	1.482	1.521
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630	1.689	1.749
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842	1.925	2.011
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082	2.195	2.313
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353	2.502	2.660
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658	2.853	3.059
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004	3.252	3.518
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395	3.707	4.046
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836	4.226	4.652
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.335	4.818	5.350
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898	5.492	6.153
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.887	5.535	6.261	7.076
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254	7.138	8.137
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067	8.137	9.358
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986	9.276	10.761
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.544	7.690	9.024	10.575	12.375
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263	8.613	10.197	12.056	14.232
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727	8.062	9.646	11.523	13.743	16.367
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835	13.585	17.000	21.231	26.462	32.919
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449	22.892	29.960	39.116	50.950	66.212

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

NOV 24 2014

**MEMORANDUM**

**SUBJECT:** Financial Capability Assessment Framework for Municipal Clean Water Act Requirements

**FROM:** Ken Kopocis *Keneth Kopocis*  
Deputy Assistant Administrator  
Office of Water (OW)

Cynthia Giles *Cynthia Giles*  
Assistant Administrator  
Office of Enforcement and Compliance Assurance (OECA)

**TO:** Regional Administrators  
Regional Water Division Directors  
Regional Enforcement Division Directors

In May of 2012, we distributed the Integrated Municipal Stormwater and Wastewater Planning Approach Framework (Integrated Planning Framework). Since that time, we have made solid progress in promoting integrated approaches to meet Clean Water Act (CWA) obligations. Thanks to the hard work of regional and headquarters staff, and the active engagement of cities, many of our enforcement settlements now embody integrated planning principles in the structure and schedule for injunctive relief or explicitly include integrated planning as part of the settlement. We have also seen an increasing number of municipalities and local authorities moving towards developing integrated plans to support the development of their NPDES permits. We have been working with EPA Regions and States to assist in that process.

As the implementation of the Integrated Planning Framework has progressed and evolved, we have been actively engaged with stakeholders on ways to build on our efforts. Those discussions found a natural focus on issues related to the financial capability of permittees working toward our shared goals of clean water. One consistent theme that emerged was the benefit of more clearly articulating the flexibility available under the existing guidance. EPA continues to be guided by the 1997 "Combined Sewer Overflows – Guidance for Financial Capability Assessment

and Schedule Development” (FCA Guidance) that provides an aid for assessing financial capability as part of negotiating schedules for implementing CWA requirements for municipalities and local authorities. The FCA Guidance also encourages permittees “to submit any additional documentation that would create a more accurate and complete picture of their financial capability” that may “affect the conclusion” of the analysis described in the guidance.

As part of EPA’s commitment to implementing CWA objectives in a sustainable manner, we have developed the attached “Financial Capability Assessment Framework” (FCA Framework). The FCA Framework has been greatly informed by the comments and experiences of a variety of stakeholders and financial experts. The FCA Framework identifies the key elements EPA uses in working with permittees to evaluate how their financial capability should influence schedules. In addition, the FCA Framework provides examples of additional information that may help some communities provide a “more accurate and complete picture” of their financial capability as is envisioned in the FCA guidance. We will be posting the FCA Framework to our website as an important next step in the pursuit of integrated planning approaches and in our ongoing work with municipalities and local authorities to achieve our shared goals of protecting our nation’s waters. While this memorandum releases the FCA Framework, we know that we will continue to learn and refine our understanding of the issues surrounding financial capability assessments as we use it moving forward. We will continue to look for ways to improve the Framework as we gain new insights and additional information.

We look forward to continue working with the Regions on these important issues and encourage you to contact Deborah Nagle, Director, Water Permits Division ([nagle.deborah@epa.gov](mailto:nagle.deborah@epa.gov)) and Mark Pollins, Director, Water Enforcement Division ([pollins.mark@epa.gov](mailto:pollins.mark@epa.gov)) with any questions you might have.

Attachment

cc: Regional Permit and Enforcement Liaisons

# FINANCIAL CAPABILITY ASSESSMENT FRAMEWORK

November 24, 2014

## Purpose

The Environmental Protection Agency (EPA) is committed to working with state and local government partners to assist local municipalities and local authorities to meet Clean Water Act (CWA) obligations in a manner that recognizes the unique financial challenges that local jurisdictions face. This financial capability assessment framework is intended to provide additional examples and greater clarity on the flexibilities built into existing guidance that local governments or authorities can use in assessing their financial capability, and the relationship between that assessment and consideration of schedules for permit and consent decree implementation. This framework builds on the progress already made in the May 2012 “Integrated Municipal Stormwater and Wastewater Planning Approach Framework,” and the experience gained from talking with communities about their financial capability in actual, on the ground circumstances. Integrated Planning has been helping in identifying a permittee’s relative priorities for projects based on the relative importance of adverse impacts on human health and water quality and the municipality’s financial capability.

## Background

Local governments and authorities want to provide clean water for their communities, and they play an essential role in providing wastewater and stormwater infrastructure and services for their citizens, businesses and institutions. These municipal functions have been an important part of implementing the CWA to protect public health and improve water quality in streams, lakes, bays, and other waters nationwide. However, significant water quality challenges remain. Public officials remain strong supporters of the CWA goals and objectives by directing the public investments that are necessary to comply with the Act and to provide clean water for their citizens. Many local governments face complex water quality issues that are heightened by the need to address population growth or decline, increases in impervious surfaces, source water supply needs, and aging infrastructure. In recent years, many local governments and authorities have increased investments in their wastewater and stormwater infrastructure through capital projects to rehabilitate existing systems, improve operation and maintenance, and address additional regulatory requirements. As programs are implemented to improve water quality and attain CWA objectives, many state and local government partners find themselves facing difficult economic challenges with limited resources and financial capability. We recognize these challenging conditions and are working with states and local governments to develop and implement new approaches that will achieve water quality goals at lower costs and in a manner that addresses the most pressing problems first.

Long-term approaches to meeting CWA objectives should be sustainable and within a local government or authority’s financial capability. The financial capability of these entities and other relevant factors are important to consider when developing appropriate schedules for infrastructure projects in permits or enforcement actions to help protect human health and the environment. EPA’s financial capability assessment guidance, “Combined Sewer Overflows:

Guidance for Financial Capability Assessment and Schedule Development” (FCA Guidance) (EPA 832-B-97-004) provides a reference point to aid all parties in negotiating reasonable and effective schedules for implementing CWA requirements, and the flexibility to take into account local considerations that may not be fully captured by the approach detailed in the guidance. As described in more detail in this Framework, the guidance provides for consideration of the impact on residential rate payers and the financial capability of the permittee using a suite of indicators, as well as allowing schedules to be responsive to circumstances unique to that community, while advancing the mutual goal to protect clean water. The FCA Guidance encourages permittees to provide any additional information that would be useful in understanding those unique or atypical circumstances and how they may affect CWA schedules, so that all relevant information presented by a community can be taken into account to ensure that a full understanding of financial capability guides the development of schedules.

### **Financial Capability Assessment**

The following are key elements of EPA’s approach to the evaluation of the financial capability of municipalities to inform implementation schedules, both in permits and enforcement actions. The elements are fully compatible with the FCA Guidance, integrated planning approaches, and the flexibility embodied in both.

1. **The 1997 FCA Guidance identifies a valuable assessment that provides a common basis for financial burden discussions between the permittee, EPA and state NPDES authorities. Permittees have the option of submitting additional information that would create a more accurate and complete picture of their financial conditions.** The financial capability assessment described in the 1997 FCA Guidance identifies information that provides a basis for a general comparison of financial conditions between communities across the country and provides a consistent assessment of basic financial indicators as part of the overall analysis. Additional information that the community provides on its unique financial circumstances will be considered so that schedules take local considerations into account. Where appropriate, this information can result in schedules that are different than the schedules suggested by the baseline analysis suggested in the 1997 FCA Guidance.
2. **Financial capability is on a continuum.** Although the FCA Guidance approach categorizes financial burden as “high, medium, or low,” this does not mean that schedules will be rigidly set according to the break points between the categories. For example, two communities whose total residential share of costs are 1.1% and 1.9% of median household income (MHI) are both categorized in the FCA Guidance as having a “medium” burden for the Residential Indicator (RI). All other things being equal, the appropriate schedules for those communities are likely to be different. Similarly, all other things being equal, two communities whose residential share of costs are 1.9% and 2.1% of MHI would be more likely to have similar overall compliance timeframes, even though one community is ranked as having a “medium” burden and the other as having a “high” burden. Finally, additional information submitted by the community may affect the length of the schedule regardless of where the community is on the “high, medium, and low” continuum.

3. **EPA will consider all CWA costs presented in the analysis described in the FCA Guidance.** EPA originally published the FCA Guidance to assist in negotiating schedules for communities with combined sewer systems, as these typically represent the most expensive CWA compliance issues. The FCA Guidance has since been recognized as equally suitable for considering other municipal CWA obligations as well, such as those related to separate sanitary sewer systems. With the release of EPA's 2012 Integrated Planning Framework, the Agency clarified that the financial capability analysis could include costs of: stormwater and wastewater; ongoing asset management or system rehabilitation programs; existing, CWA related capital improvement programs; collection systems and treatment facilities; and other CWA obligations required by state or other regulators. Where the costs of multiple CWA obligations are included in an FCA, each of those costs should be enumerated separately, so as to provide an understanding of how each contributes to the overall analysis.
  
4. **When presented, Safe Drinking Water Act (SDWA) obligations will be considered, primarily as additional information about a permittee's financial capability.** EPA believes that the SDWA obligations of a community can be an important consideration in establishing schedules for implementing integrated plans. EPA recognizes that both clean water and drinking water costs are often covered through charges on a single rate base. One component of a financial capability assessment includes an evaluation of the residential indicator that is based on only CWA costs as this best reflects the intended use of the metric and allows for comparisons with other communities. Drinking water costs may be reflected in other components of a financial capability assessment. For example, the financial capability indicator includes consideration of bond rating of the entity that issues debt to fund the permittee's capital project, which can be impacted by both wastewater and drinking water obligations for a permittee that provides both services. If a community has incurred general obligation debt associated with the SDWA, these obligations would be considered in the indicator "overall net debt as a percent of full market property value." In addition, as discussed below, additional information, including information regarding drinking water obligations, may be submitted for consideration in analyzing financial capability. To the extent that drinking water costs are not fully addressed by these other components, communities are encouraged to provide additional information about these costs.
  
5. **Communities should demonstrate how the CWA work included as costs in the financial capability assessment will be implemented, including appropriate assurances that those expenditures will be made.**

### **The Financial Capability Assessment Guidance and Examples of Additional Information that are Relevant to a Consideration of Financial Capability**

The specific approaches laid out in the FCA Guidance provide a good foundation for the assessment of financial capability. As stated in the guidance and outlined in this Framework, communities can build on that foundation to include additional relevant information. The FCA Guidance presents a two-phased approach to assessing overall financial capability. The first phase assesses the impact on residential customers, and the first step is to calculate the portion of

the annual costs that would be borne by residential households for both current and projected Clean Water Act related expenses. The residential share of the annual costs of CWA obligations is then compared to the MHI of the service area. MHI is calculated using current census data and may be adjusted based on the current Consumer Price Index. Finally, the CWA compliance costs per household are divided by the adjusted MHI to calculate the residential indicator (RI). The FCA Guidance then identifies various ranges of RI scores as “low, mid-range or high” levels of burden. In situations where there are unique circumstances that would affect the conclusion of the first phase of the assessment, additional information documenting unique financial conditions may be submitted.

The second phase of the financial capability analysis assesses the financial strength of the permittee. Six indicators are used to evaluate the debt, socioeconomic and financial conditions that affect a permittee’s financial capability to implement CWA controls necessary for compliance with the Act. These include bond ratings, overall net debt as a percent of full market property value, unemployment rate, median household income, property tax revenue collection rate, and property taxes as a percent of full market property value. In the Guidance, EPA has established benchmarks for each of the six indicators showing whether the indicator reflects a “weak”, “mid-range”, or “strong” financial capability. These benchmarks are used to generate an overall score of a permittee’s financial capability.

The residential indicator calculated in phase one and the permittee capability indicators analyzed in phase two are evaluated together in a Financial Capability Matrix to assess the level of financial burden. The level of burden is then used to inform discussions to establish an appropriate schedule for meeting CWA obligations in permits and enforcement actions. EPA uses these indicators, including the annualized costs as a percent of MHI, to help assess when costs are reaching levels that may represent a high burden on ratepayers and that longer compliance timeframes are likely to be appropriate to spread the cost over a longer period. EPA does not view or use the Financial Capability Matrix as a rigid metric that points to a given schedule length or threshold over which the costs are unaffordable.

Permittees have suggested and the FCA Guidance recognizes that the two step analysis may not provide a complete representation of financial capability. As noted above, other relevant financial or demographic information presented that illustrates the unique or atypical circumstances faced by a permittee will also be considered in evaluating financial capability. The presentation of additional information can be very valuable in analyzing financial capability, and the submission of this type of information has become fairly common practice. For example, in many consent decree negotiations, additional information has resulted in the establishment of schedules that differ from the ones suggested by the baseline analysis described in the FCA Guidance.

Some examples of information that may be relevant in negotiating schedules to be included in permits and consent decrees are given below. In order for such information to adequately illustrate that a permittee’s situation is atypical, EPA encourages permittees to compare any additional information on their circumstances to national averages or to that of other permittees.

The examples given below are not intended to be a complete list, nor a list of factors that will be relevant in every community. Rather it provides an illustration of information that may prove useful in some instances.

Examples of Information Related to Residential Impacts:

1. Income distribution by quintile, geography or other breakdown, illustrating how income distribution in the service area differs from comparable data on the national level or for similar cities.
2. Where cities have adopted differential rates for low income customers, the income distribution that led to that rate structure.
3. Information about service area poverty rates and trends.
4. Projected, current and historical sewer, and stormwater fees as a percentage of household income, quintile, geography or other breakdown.
5. Information on sewer and water usage for various classes of ratepayers or by type of dwelling unit.
6. Information on the percent of households who own versus rent.

Examples of Information Related to Financial Strength:

1. Historical population trends or population projections.
2. Service area unemployment data and trends, or other labor market indicators, including unemployment on an absolute basis.
3. Rate or revenue models, including dynamic financial planning models showing the projections of impacts over the program period. All revenue sources tied to CWA obligations may be included as appropriate.
4. Rate determination studies used to develop and support recent rate increases.
5. Data and trends on late payments, disconnection notices, service terminations, uncollectable accounts, or revenue collection rates.
6. Historical increases in rates or other dedicated revenue streams.
7. State or local legal restrictions or limitations on property taxes, other revenue streams or debt levels.
8. Other costs or financial obligations, such as those that relate to drinking water or other infrastructure, that significantly affect a permittee's ability to raise revenue.
9. Circumstances that may affect a permittee's bond rating. For instance, incurring debt beyond certain thresholds may negatively impact the permittee's bond rating, thus reducing the ability to raise capital.
10. Financial plans that show the implications of incurring additional debt for a permittee's ability to secure financing, including projections of metrics such as debt ratios, debt service coverage, debt per customer, days of cash on hand, days

of working capital and other metrics used by rating agencies. Such data should be benchmarked to metrics such as rating agency medians and relative to similar entities. This will be especially relevant where the permittee does not have a bond rating.

11. Extraordinary stressors such as those from natural disasters, municipal bankruptcies, unusual capital market conditions, or other situations which impact a permittee's ability to raise revenue or acquire needed financing. When such stressors occur, they may also provide support for making changes to existing schedules.