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Municipal Facilities Division
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Touching All The Bases

A Financial Management Handbook For Your Wastewater Treatment Project

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This report has been reviewed by the Environmental Protection Agency (EPA) and approved for publication. The views, opinions, conclusions, and recommendations herein do not necessarily reflect those of the EPA. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Foreword

This handbook, developed for EPA's Office of Municipal Pollution Control, explains how to manage your community' s finances during the planning and construction of a wastewater treatment system. Financial management during this period is a very complex and exacting task, but it is a task that must be diligently performed in order to protect the considerable investment you are making in the treatment system. Because your ability to manage events depends directly on your ability to anticipate them, this document devotes appropriate attention to the key events which must precede the commencement of construction as well as those activities which you must perform during actual construction and in the period immediately following.

This handbook is only intended to provide the reader with a general background of a very complex subject, spanning, as it does, the planning, design, and construction stages. EPA has developed various other publications dealing with municipal finance and treatment technologies that are applicable to specific stages of treatment plant development and operation. These publications should be read by those directly responsible for the success of the treatment project. Two of the publications relating to finance are listed in the bibliography (*Financial Capability Guidebook* and *User Charge Guidance Manual*), along with publications dealing with other wastewater treatment plant topics. Information on the *Guidebook* and *Guidance Manual,* plus information on other financial management publications, can be found in the current edition of the Financial Management Publications Update for Wastewater Treatment Plants. The Update and most other EPA publications dealing with financial management are available from the Environmental Quality Instructional Resource Center, 1200 Chambers Road, Room 310, Columbus, Ohio 43212. (Telephone: (614) 422-6717).

This publication was written by James C. Joseph, Paul L. Shinn, and Joseph T. Kelley of the Government Finance Research Center (GFRC) of the Government Finance Officers Association (GFOA). Additional assistance was provided by John Peterson and Arthur Gitajn, also of GFRC. The project was managed for EPA by Brian C. Rourke.

Note that the statements, conclusions, and recommendations contained herein should not be construed as setting forth any legal or regulatory requirements beyond those set forth in the Clean Water Act, as amended. (33 U.S.C. 1251 et seq.) and EPA's construction grants regulation, 40 CFR Part 35; general grant regulation 40 CFR Part 30; and grant procurement regulation 40 CFR Part 33.

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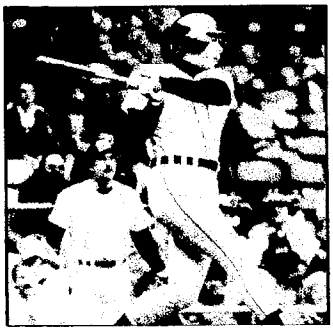

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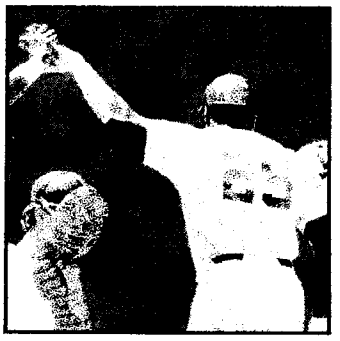

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A Series of Worldly Tips and Traps

TIP: *A wastewater treatment facility requires provision for ongoing operating and maintenance expenses, which are often higher than the annual debt service obligations. Special care must be taken to evaluate the potential operating budget impact of any capital investment. (Chapter II, p. 10)*

TRAP: *A community that leaves in-house responsibilities to outside specialists loses some of its decision-making power and thereby relinquishes control of the project. (Chapter II, p. 13)*

TIP: *The selection of the wrong technology can be one of the most expensive mistakes a community can make. You must be sure that the technology being considered is the most appropriate (and cost-effective) for its purposes. Alternative treatment and collection technologies should be carefully considered, especially in small communities. (Chapter II, p. 15)*

TIP: *The term of the bonds should never exceed the expected useful life of the facility. If it does, you may end up paying debt service on two bond issues for the same purpose. With this rule in mind, you have some flexibility in selecting a term that most closely matches the desired cash-flow pattern. (Chapter III, p. 24)*

TRAP: *One common cause of shortfalls during construction is overly optimistic budgeting. Communities that have run out of funds in the construction phase have often been guilty of optimistic budgeting, particularly in these items:*

- *interest earnings during construction,*
- *proceeds from short-term financing,*
- *items eligible for EPA grant funding,*
- *costs of issuing debt, and*
- *construction costs.*

(Chapter III, p. 29)

TIP: *It is important to forecast and track the account balances for every one of the accounts because you must maintain a positive balance in each one. If the community overdraws the account for construction, it will be barred from paying construction bills from other accounts by legal and investor restrictions. It will in effect be unable to pay its contractor. (Chapter III, p. 31)*

TRAP: *The five most common accounting problems for communities receiving grants are:*

- *failure to separate eligible and ineligible costs;*
- *failure to segregate costs between different grants;*
- *failure to develop written procedures for grant accounting;*
- *failure to justify and record Federal reimbursements;*
- *failure to maintain documentation supporting payment requests. (Chapter IV, p. 40)*

TRAP: *One common mistake made by communities with construction projects is using separate bank accounts to keep track of different types of money. This should be avoided at all costs and done only when note or bond indentures require separate bank accounts to secure the debt obligations. Multiple accounts are expensive to maintain and to balance, and they also promote accounting errors. (Chapter IV, p. 41)*

TIP: *In a falling interest rate environment, the interest yields in an investment pool are generally higher than those available through independent investing. This is because the interest yield in the pool is determined in part by securities that were purchased when rates were high. (Chapter IV, p. 43)*

TIP: *It is a good practice to develop an updated cash-flow forecast every month. This new forecast should reflect the actual cash-flow up to the date of the forecast, with a revised monthly forecast of all sources and uses for the remainder of the project. (Chapter IV, p. 48)*

TIP: *Long-term self-sufficiency of the treatment plant can be ensured by writing the rate ordinance so that any required rate increases are automatically built into the operating budget approval process. (Chapter V, p. 52)*

TIP: *Since the time needed to complete a bond sale varies with the type and complexity of the sale, the length of time needed should be determined well in advance of the need to sell the bonds. You should time the bond sale so that proceeds are available to pay off any short-term financing and any costs of construction that will not be paid from cash or short-term financing. (Chapter V, p. 52)*

TIP: *The financial advisor should solicit input from potential underwriters to determine the need for a rating on small issues. If you have outstanding debt that has been rated, all subsequent issues with the same security should also be rated. Failure to request a rating of a new issue with the same security provisions as currently-rated debt could result in the withdrawal of the existing rating. (Chapter V, p. 52)*

CHAPTER I

Introduction: taking the field

Building a new wastewater treatment plant is a major undertaking even for America's largest cities. For smaller jurisdictions, the construction project may well be the largest single public works project ever undertaken. Besides being costly, building a treatment facility is both time-consuming and complex. Because of all of these factors, wastewater facilities construction requires special management efforts, particularly in the realm of financial management.

It is easy to overlook the financial aspects of a construction project, particularly in the planning stages. When you contemplate building new facilities you tend to concentrate your efforts on selecting an engineer, designing the facility, purchasing land, hiring a contractor, and watching the new plant rise from the ground. Unfortunately, this approach often leads to shortcomings in financial management, which can lead to serious problems as the plant is being built and when it becomes operational.

Finance should be a major consideration at every step of the process of building or upgrading facilities, from design through construction and completion. You must make special efforts to secure both short-term and long-term financing; to determine the impact of the project on operating revenues, expenses, and user fee levels; to monitor all financial transactions relating to design and construction; and to protect your community's financial interest throughout the process.

Failure to establish and follow good financial management practices can lead to serious problems that often either delay completion of the facility or stop it altogether. The pitfalls are many and varied. A few of the more common problems are:

- building a project that is too costly for the community;
- failing to verify that the contractor's bills reflect work actually completed;
- allowing costs to exceed available funds;
- failing to maintain cash balances that are adequate to pay project costs;

- jeopardizing opportunities for Federal and State grant funds by failing to maintain good records; and
- failing to make arrangements for workable long-term project financing.

The purpose of this handbook is to help local governments that anticipate building new treatment facilities minimize the likelihood of falling into these traps. It is aimed primarily at smaller governments that are building their facilities with the assistance of a grant from the U.S. Environmental Protection Agency (EPA), but it can be of use to any jurisdiction that is constructing a treatment plant, regardless of size or funding sources.

This handbook concentrates mainly on the considerations involved in securing and then managing short-term and long-term financing for the construction project. However, it is impossible to look at these topics in isolation. Your community must also understand the importance of engineering, planning, controlling and reporting and how each of these tasks can be designed to contribute to good financial management. Similarly, management of finances during construction cannot be explained without an understanding of what happens both before construction begins and after it ends.

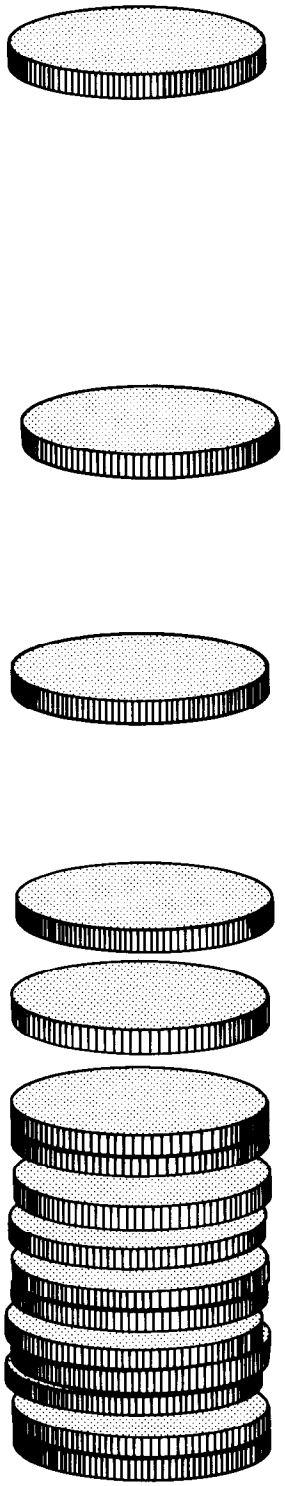
The handbook is organized chronologically, so that you can walk through the entire process, from the early planning stages through actual construction to arrangement of long-term financing and the final audit of the project. In Exhibit 1, you will find an approximate representation of how the financial management functions discussed in this handbook relate chronologically to the steps taken toward completion of the treatment facility.

Like many examples in American life, the construction financing process can be spoken about in terms of the game of baseball. The handbook uses a trip around the bases as a metaphor for the process; you can think of the planning stage as getting you to first base, pre-construction getting you to second, construction moving you around to third, and preparing for an audit and closing the project as the trip home. This metaphor will help you keep track of where you are in the process.

In addition to the text, the handbook includes graphic representations of the major points of the financial management process. Exhibits show how various types of financing relate and how the processes begin and end. Highlighted "tips" and "traps" give an idea of special opportunities and problems to watch for during the construction financing process. A glossary of financial terms is included as an appendix to the handbook. Terms that are defined in the glossary are highlighted in **bold** print the first time they appear in the text.

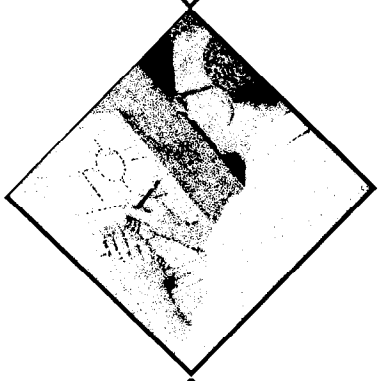
This handbook is not intended to be your only source of information on financing during construction. It is, rather, an overview of the financial events that are involved in the construction process and illustrates how these events relate to the construction itself. By taking this approach, the handbook promotes a broad understanding of what to watch for in the process and how best to manage the project financially. It is hoped that this will help your community achieve its goal of completing construction within budget and on time. Additional sources of information can be found in the bibliography.

Exhibit 1

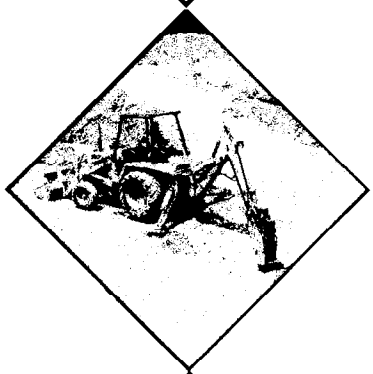


Financial planning should occur during the same time as facilities planning for the WWT project.

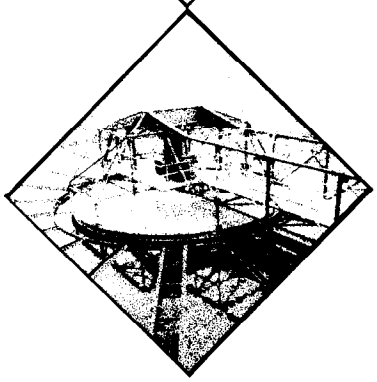
The pre-construction phase of financial management should begin as soon as planning is finished and should be completed no later than the time plant design work is done.



The construction phase of financial management occurs at roughly the same time as the construction of the facility, though it is wise to begin certain tasks (establishing accounting systems) in the pre-construction phase, if possible.

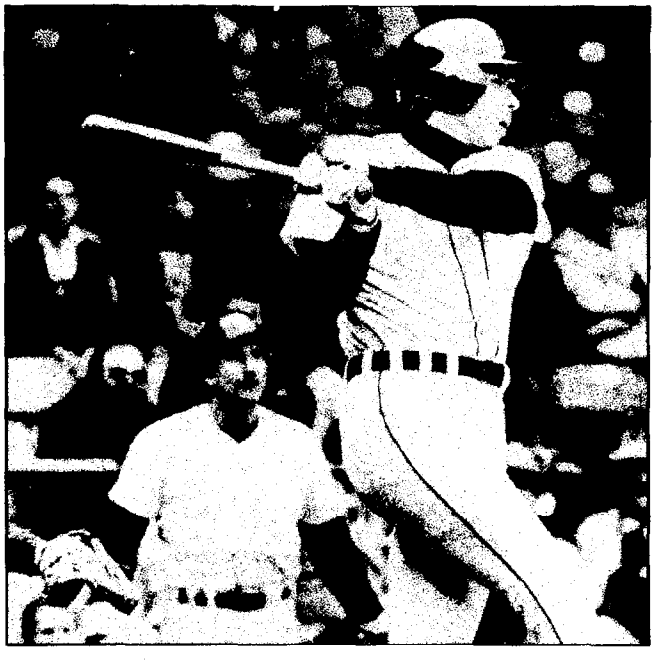


The completion phase of financial management occurs during the last part of plant construction.



CHAPTER II

The financial planning phase: getting on base



A structured, well-defined planning process can help your community order its priorities and better respond to the pressures associated with new **capital projects.** In this way, you can evaluate your capital investments and look at each individual project in the context of your entire capital and operating program. Once you decide to begin a capital project, you should establish the policy and financial and legal bases for the project *before* beginning the design phase.

This section describes a process for planning that will help you put your wastewater treatment facility into the broader perspective of your community's capital needs as a whole. The *first* step in this process is to understand the ground rules under which you will be operating. The *second* step is to prepare a capital plan and budget, which lists all construction in priority order and determines the schedule and funding method for each. The *third* step is to assemble a team of experts from both the local government staff and outside consultants to design the project, develop the financing plan, and assure that it all works from the legal and administrative points of view. The *fourth* step in the planning process is to develop the plan for the project itself. This phase includes design (engineering), detailed budgeting and scheduling, and refining the financing plan. When this planning process is complete, you can think of yourself as having reached first base; much of the hard work is behind you, and you have a much better chance of scoring a run later in the inning.

UNDERSTANDING THE GROUND RULES

Because local governments are responsible for their taxpayers' money, it is not surprising that they face a wide range of laws and regulations that direct their actions. It is also reasonable to assume that many of these laws will govern major construction projects because of the large dollar amounts involved. The goal of these constraints is to promote sound financial management to assure that public funds are kept and used wisely. Your community should therefore not resent the level of regulation, but use it as a guide to developing sound management systems.

It is important to read and understand applicable laws and regulations early in the process to avert unexpected

legal problems later. Wherever possible, this handbook refers to specific legal requirements in the appropriate sections. It is useful, however, to review all of these requirements at this point, so that you may stop and determine the legal constraints you will be facing *before* continuing into the pre-construction phase.

Grant Eligibility

The U.S. Environmental Protection Agency (EPA) currently awards grants to communities for the construction of treatment facilities, generally for 55 percent of eligible costs. As soon as your community identifies its wastewater treatment needs you should determine whether your project will be eligible for an EPA or a State grant. In most States, an agency is delegated to work with communities to manage the grants process. You should locate the appropriate agency in your State to find answers to these questions:

- Is your project presently eligible for a grant?
- If not, how could your project become eligible?
- What is required for eligible projects to receive a grant?

Federal Laws and Regulations

The Clean Water Act requires that your community provide adequate levels of wastewater treatment prior to discharge into rivers, streams, lakes, and other bodies of water. You will have to address these clean water standards whether or not you receive a construction grant. This requirement will thus influence other municipal decisions, especially those relating to your **capital improvement program**. If a Federal grant is provided, communities must also satisfy a number of Federal requirements (summarized in the EPA publication, *Construction Grants—1985)* as a condition of such financial assistance. Those requirements that relate to the financial management aspects of wastewater plant construction are covered in detail in the appropriate sections, but are summarized for planning purposes here as well:

- Financial capability: EPA's Financial Capability Policy requires that grant applicants demonstrate their capability to finance and manage plant construction and operation. EPA has prepared the *Financial Capability Guidebook* to assist grantees with this step. Financial capability analysis is a useful planning tool because it assists the community in determining all construction and operating costs, in evaluating the level and impacts of **user charges** necessary to support the facility, and in assessing the community's ability to sell **bonds** to finance construction. This process should be integrated into the project planning phase so that the community may identify at the earliest possible time any problems with project impacts or financing.
- Financial management and record-keeping: EPA also requires that grantees maintain a financial management system that records and reports accurately all grant-related financial activities and controls the project budget. Chapters III and IV of this handbook provide detailed information on project accounting. EPA has also published the *Financial Management System Manual* to provide assistance in developing an **accounting system**.
- User charges: EPA requires that grantees establish and maintain user charges throughout the useful life of the facility at a level sufficient to offset costs of operating and maintaining the facility and for replacing components as necessary. This regulation also requires that charges be in proportion to actual use by each customer. See Chapter III for a description of the user charge study process and 40 CFR 35.2140 for the complete requirement. Additional guidance in developing a user charge system is offered by EPA in the *User Charge Manual.*

If your community sells notes or bonds, it will also be subject to regulations issued by the U.S. Treasury Department. These regulations specify steps you must take to assure that interest on **debt** is tax-exempt, so that you may take advantage of the lower interest available in the municipal market. The regulations are complex; your bond counsel and financial advisor should work together to structure the financing to ensure that it complies with all Treasury requirements and still meets your needs to the greatest extent possible. (Note: This is particularly important if changes are made to existing tax legislation as part of the tax reform effort pending before the current (1986) Congress.)

State Laws and Regulations

It is impossible to provide in this manual an exhaustive list of all State laws that might govern the financial management aspects of treatment facility construction. The approach of this subsection is to give you a list of typical State requirements so that you may identify and comply with the specific laws of your State. Common State requirements are:

- Budget laws: Most States require local governments to prepare an annual budget. The treatment of construction grants and project **expenditures** in a budget varies somewhat. Ask your budget officer to review State laws to determine how to budget for the project. Remember that budgets often have long lead times and that State budget laws need to be addressed early in the process.

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***TIP:** Remember that a construction project may have to be budgeted in more than one annual budget if it takes more than one fiscal year to complete.*

- Purchasing laws: States usually limit local governments' freedom to purchase goods and services. They typically require that contracts be awarded on the basis of competitive bidding. Your State may have very specific requirements on preparing specifications, advertising the bid, and deciding how to award the bid. Be sure to review these laws to understand their impact on costs and time requirements for the purchasing process.

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***TRAP:** Some States exempt contracts for certain services (e.g., engineering, financial advisor, etc.) from competitive bidding. Despite this authority, it is both contrary to EPA regulations and a bad management practice to select any professional advisor without some level of competition. (See 40 CFR Part 33.)*

- Accounting and auditing: Some States specify how local governments should keep their accounting records. Also, if your community receives more than $100,000 in federal funds during a fiscal year, Office of Management and Budget (OMB) Circular A-128 requires that you obtain an audit of your records each year. Your finance officer should be aware of these limitations and should help set up a project accounting system that both meets State law and provides needed information about and control over the project at hand. Note also that some States require an annual **audit** that may include an audit of how grant funds were handled; so your project may be audited twice. Remember this when storing records. (See 31 U.S.C. 7501 et seq.)
- Investing: States are sensitive to possible loss of public funds through poor **investment** decisions, especially in light of recent failures in the securities markets. State laws govern how note and bond proceeds may be invested. Your finance officer should be very careful to follow these laws because of the large amount of funds involved.
- Selling bonds: Every State limits to some degree a community's ability to sell bonds. The most common limitation is on the amount of **general obligation** debt that may be issued. Other common State requirements are that an election be held to approve a bond issue, that bonds be sold competitively (with advertising and disclosure requirements) and, in some States, that a State agency approve the structure of the bond issue prior to the sale. Some States will provide bond guarantees or provide partial payment of qualified **debt service**, which can lower interest rates.

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***TIP:** Before beginning to plan this project, ask your in-house attorney and bond counsel to give you a list of all State requirements on bonding and what specific steps you will have to take to comply. Also ask your financial advisor to calculate whether you have capacity within your **debt limit** to issue enough bonds to finance the project.*

Local Requirements

Local governments often impose limits on themselves in city charters or ordinances. You should ask your attorney to prepare a list of the applicable local requirements, which might cover budgeting, the bond issuance process, public input, and other processes. Be sure to allow enough time and staff resources to meet each of these requirements.

CAPITAL PLANNING

The financing arrangements for each facility, whether a school, highway, or wastewater treatment plant, must be considered within the context of a community's comprehensive capital improvement program. The capital improvement program represents a multi-year plan (usually covering 5 years) of all spending for capital projects, encompassing both necessary repair and replacement of existing infrastructure and a reasonable level of funding for facilities to accommodate growth.

The first year of the capital improvement program becomes the community's **capital budget**. At that time, a review of the entire capital improvement program takes place, resulting in the addition and deletion of projects and the extension of the plan another year into the future. **Appropriations** for capital projects usually extend beyond a single fiscal year. For this reason, a government must coordinate its efforts to ensure that past, present, and proposed commitments in the capital improvement program can be funded with resources that are expected to be available (current, projected, and borrowed).

The importance of careful planning and priority-setting within the capital improvement program cannot be overstated. Too often governments reduce capital appropriations in periods of fiscal stress, transferring

funds for these purposes to more visible operating programs. This practice only defers needed maintenance and repair and results in more costly remedial actions in the future. An effective capital improvement program is well-documented and based on carefully conceived funding criteria, giving elected officials adequate justification for capital spending, even in difficult financial periods.

The central features of an effective capital improvement program are: (1) facility inventory and project identification; (2) priority-setting; (3) assessment of funding sources; and (4) capital budgeting.

Facility Inventory and Project Identification

The capital planning process begins with a comprehensive assessment of existing facilities and equipment. This review includes appraisal of the current condition of existing infrastructure, identification of the dates of construction or acquisition of all **capital assets**, and estimation of the remaining useful life of each capital item.

Related to the facility inventory is the development of a schedule to provide for the regular maintenance, repair, and **replacement** of existing infrastructure. It is necessary to know the **replacement costs** of wastewater treatment equipment and facilities in order to determine budget needs and to develop user charge requirements.

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***TIP:** Operating appropriations for routine maintenance must be carefully coordinated with the schedule developed for the capital improvement program, so that the community does not waste money maintaining an item it will soon replace. On the other hand, good maintenance practices can extend replacement schedules in the capital improvement program.*

Following the inventory of existing facilities and equipment, the community must identify future demands for new capital investment. These determinations are most effective when made against the backdrop of a comprehensive land use plan that defines a distinct "urban services boundary" (that region which will receive urban services). With this clear sense of the potential demand for services in the future, your government is in a good position to determine appropriate levels of funding for growth, as well as for existing needs.

Priority-setting

You will probably be faced with more projects on your capital facilities "wish list" than can be funded with currently available resources. This resource allocation problem requires an administrative process that ranks each proposed project in order of priority. It is in this priority-setting phase that citizen involvement is solicited to build a level of support for the proposed capital program. In the case of priority-setting for wastewater treatment plants, you must also recognize the clean water requirements of State and Federal governments, as expressed most commonly in permits establishing effluent limits for your treated wastewater.

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***TRAP:** Failure of growing communities to invest in a wastewater treatment system that keeps pace with their needs can result in violations of the Clean Water Act, possibly resulting in monetary penalties and a ban on any new sewer hook-ups. Note, however, that EPA grants generally are available only to meet existing needs.*

Your priority-setting process should include the identification and evaluation of all potential financing sources for each capital item.

Assessment of Funding Sources

The process of identifying new projects to be funded must recognize the limits of available resources, including borrowing. Examples of funding sources are:

- grants and intergovernmental **transfers**;
- low interest loan programs and bond banks;
- utility and enterprise system **revenues**;
- current general government funds;
- capital **reserves**; and
- general obligation and **revenue bonds**.

A good rule of thumb in the evaluation of financing sources is to emphasize those which do not deplete the community's limited resources. For example, the use of grants is always preferable to draw-downs of capital reserves. Similarly, low-interest loans from State and Federal agencies are almost always more desirable than the direct issuance of bonds by the local government.

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***TRAP:** A community that delays construction of a needed treatment plant in the hope of obtaining a grant or better financing arrangements runs a serious risk of substantial penalties through court-ordered fines if the delays result in continued (or new) discharges of inadequately treated wastewater in violation of the Clean Water Act.*

As you consider the appropriate mix of borrowing and "pay-as-you-go" financing of capital improvements, you must recognize the practical (as well as the legal) limits to each approach. Pay-as-you-go financing allows you to avoid payment of interest on borrowed funds by financing capital improvements with available funds from accumulated user fees and charges, assessments, capital reserves, and taxes.

A principal disadvantage of pay-as-you-go financing is the heavy burden you will place on current residents to fund facilities that have long useful lives. This issue of intergenerational equity argues that projects should be paid for by all potential users, both current and future. In addition, the limited resources available under a full pay-as-you-go system may force your government either to forego needed projects because current revenue sources are inadequate or to raise taxes to unacceptable levels to meet essential needs.

From a practical standpoint, very few governments rely exclusively on a pay-as-you-go system, preferring to implement a balanced system of capital financing from current *and* future (projected and borrowed) sources.

Borrowing

Generally speaking, borrowing is necessary to fund major capital projects. This must be done carefully since most jurisdictions are subject to either constitutional or statutory limits on the amount of bonded debt that may be incurred. Other governments are constrained by the requirement that voters must approve issues pledging the general credit and taxing power of the entity. In addition, there are the very real perceptions of credit analysts and the investment community that determine the ease of market access and the interest rate at which funds will be available. It is not too early for your community to begin consideration of financing alternatives at this point in the planning process.

Tax-supported debt:

There is no certain way of determining an appropriate level of tax-supported indebtedness known as "general obligation" or "G.O." debt for a particular local government. An assessment of general obligation debt capacity includes a range of credit considerations, such as financial strength, economic diversity, and stability and quality of management. There is a point, however, at which the tax-supported debt of an issuer begins to raise questions about its capacity to service that debt. Investors often compare **key debt ratios** of an issuer to other similar jurisdictions to determine the *relative* debt burden. Among the most important ratios are: (1) net tax-supported debt as a percentage of personal income; (2) net tax-supported debt as a percentage of estimated full cash value of taxable property; and (3) net tax-supported debt per capita. Your community's relative position with regard to each of the ratios should be considered in deciding whether to issue tax-supported debt.

Moody's Investors Service and Standard & Poor's Corporation, the nation's two largest municipal bond rating agencies, use debt statistics from a broad range of similar issuers to develop high, low, and median figures for each of these indicators. Serving as the basis for comparison, these data are useful to municipalities as they develop their capital financing plans.

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***TIP:** Moody's publishes its "Selected Indicators of Municipal Performance" each year and many communities use these ratios as debt affordability guidelines in the development of their capital improvement programs.*

Tax-supported debt is usually well received in the credit market, reflecting the ability of the issuer to assess taxable property to secure the issue. This general obligation debt offers the additional advantage of structural flexibility (e.g., the redemption schedule may provide for level principal payment, level debt service, or any reasonable variation thereof). Disadvantages include the need to secure voter approval (in most cases), the reduction in general borrowing capacity, and the additional burden on taxable property.

Because general obligation debt typically pledges the taxable resources of the entire community, such debt should be used for general-use facilities. Where specific use groups can be identified, the formation of **special taxing or assessment districts** may offer a more acceptable form of security.

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***TRAP:** Failure to recognize that tax-supported debt must be employed selectively has, in the past, resulted in citizen concern over the levels of property taxation and has contributed to the adoption of property tax limitation measures (e.g., Proposition 13 in California and Proposition 2 in Massachusetts).*

Revenue-supported debt:

Revenue-supported debt represents an alternative to the use of general obligation debt that has been used much more frequently by local governments in recent years. The principal advantages of revenue debt are:

- it is secured by fees and charges paid by the users of the facility;
- it preserves general obligation borrowing capacity for those projects that do not generate revenues; and
- it is usually not subject to debt limits.

However, interest rates are usually higher on revenue debt than on general obligation issues. This is because the pledge to secure debt service is limited to the revenue source (charges to users of the wastewater treatment facility). To provide protection against fluctuations in the collection of revenues, issuers of revenue debt must fund a **debt service reserve** and pledge to maintain rates and charges at levels that will ensure coverage of debt service.

Revenue debt capacity is generally fairly easy to determine, because the limits of the revenue system are clearly defined with a finite number of quantifiable variables. Among the central considerations in the analysis of revenue debt are:

- the demand for the service being provided;
- the operating history of the utility or enterprise;
- the degree of control over rates and charges exercised by the issuing government; and
- the provisions made for unexpected contingencies.

Despite the fact that governments often enjoy a virtual service monopoly (e.g., water and sewer systems), rates must be maintained at reasonable levels. Comparisons with other governments of similar size are useful in the determination of "market" rates for various services.

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***TIP:** Connection charges, fees for extension of a service area, and other development charges are useful methods of assessing developers and new users for the burdens they add to existing systems. This is particularly important in cases where a new business may represent an unusually heavy demand on a municipal service. A chemical plant, for example, places a significant demand on a wastewater treatment facility.*

Capital Budgeting

As is the case with most governmental budgeting, the development of the capital budget (using the capital improvement program as a guide) is an exercise in the allocation of limited resources. Unlike the **operating budget**, where appropriations are made for goods and services to be consumed during the fiscal year, capital spending is a multi-year commitment. As noted previously, this requires a coordinated effort to ensure that on-going and proposed ventures are within the government's ability to pay.

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***TIP:** A wastewater treatment facility requires provisions for on-going operating and maintenance expenses, which are often higher than the annual debt service obligations. Special care must be taken to evaluate the potential operating budget impact of any capital investment.*

In most cases, governments first apply available resources through the operating budget to maintenance and repair of existing facilities, with particular emphasis on those items related to mandated improvements (e.g., wastewater treatment), public health, or safety. This preventive maintenance approach helps ensure that an existing capital item remains serviceable over its useful life and avoids the need for extensive rehabilitation or costly replacement.

The capital budget matches resources (current revenues, grant, capital reserves, and borrowed funds) with the spending priorities of the current year. If borrowing is planned, the debt service obligations in future years must be assessed vis-a-vis the impact on user fees, charges, assessments, and tax rates. The on-going nature of these debt service obligations and the need to coordinate them with anticipated future capital borrowings demonstrates the value of the long-term perspective offered by the capital improvement program.

ASSEMBLING YOUR TEAM

It is important to develop at the outset of the process a team of both in-house staff and outside consultants who will be involved in guiding the project through to completion. This team should include a wide range of talents and experience, including the disciplines of engineering, law, planning, finance, and management. To ensure that the diverse but interrelated tasks which make up the project are properly coordinated, one member of the team should have responsibility for managing the project from start to finish. Exhibit 2 summarizes the responsibilities of each team member. In many cases, however, a single individual may be able to cover several areas of responsibility; thus, a large team may not be required.

The degree to which your in-house team will be able to cover some or most of these functions will necessarily vary with the specific organizational structure of your community; nonetheless, persons with the following

Exhibit 2

Roles of Team Members by Activity

Activity	Legislative Body	Chief Administrator	Project Manager	Finance Officer	Purchasing Agent	Budget Officer	Operating Manager	Construction Manager	Planner	Attorney	Bond Counsel	Financial Advisor	Engineer	Underwriter
	In-House										Outside			
All Phases														
Planning Phase														
Understanding Ground Rules	P	P	R	P	P	P	P			L	P	P		
Capital Planning	R	P	P	P		L	P	P	P			P		
Assembling Your Team	R	L	P	P	P					P		P		
Project Planning	R	P	R	P		P	P	P	P				L	
Pre-Construction Phase														
Short-Term Financing	R		R	L							P	P		P
Designing The Bond Issue	R	R	R	L						P	P	P		
Construction Contract	R	R	L		P		P	P		P			P	
Project Budget			P	L				P				P	P	
Cash-Flow Forecast			R	L				P				P	P	
Setting User Charges	R	R	R	L		P	P		P	P				
Construction Phase														
Accounting Systems			R	L										
Processing Transactions		R	R	L				P					P	
Investing Construction Funds			R	L				P			P			
Managing The Contract	R	R	R		P		P	L					P	
Monitoring Project Progress	R	R	R	R			P	L						
Completing The Project														
Implementing User Charges	R	R	R	P						L				
Selling Bonds	R	P	R	L						P	P	P		P
Preparing For Audit			R	L	P			P					P	

Legend:

L=*The individual performing this function should take the lead role in this activity*

R=*The individual performing this function should have a review/approval role in this activity*

P=*The individual performing this function should participate in this activity*

responsibilities should be involved throughout the process:

- *Legislative body:* The community's elected body has ultimate responsibility for the success or failure of the project and its impact on the community. They should actively involve themselves and keep themselves informed throughout the process. In addition to regular progress reports (quarterly during the design phase and monthly during construction), they should take formal action in adopting the capital budget, hiring outside consultants, approving the design and financing plans for the project, and approving the bond sale.
- *Chief administrative officer:* This employee (City Manager, County Administrator, etc.) should review and interpret all information being sent to the legislative body. The chief administrator should involve himself or herself in the capital planning process and the user charge setting process to provide a management point of view and to assess community impacts of the project.
- *Project manager:* The project manager is responsible for overall supervision and coordination of the project for your community. Because the elected officials of your community are ultimately responsible for the successful construction and operation of the project, your community needs a skillful project manager to oversee all project-related activities. The manager should be a municipal employee with experience in dealing with regulatory agencies, federal grants, and construction projects. The key concept is that a single person be given first-line management responsibility for the entire project.
- *Finance officer:* The finance officer should involve himself or herself in every stage of the process. If your community has both a treasurer and a finance director, both should be involved in the facility construction process. In the planning phase, this involvement should center around evaluating financing arrangements and assessing cost estimates. In the pre-construction and construction phases, this person should coordinate arrangements for short-term financing and take the lead in establishing and operating systems for budgeting, accounting, and reporting on the financial aspects of the project. If your community receives an EPA grant, this employee will be responsible for satisfying the financial requirements listed in the grant regulations. As project completion approaches, the finance officer should assume primary responsibility for structuring the permanent financing and for audit preparation and should also take part in the rate-setting process. Note that while the finance officer has ultimate responsibility for all of these activities, they will usually involve employees in the finance office who perform accounting and bookkeeping duties.
- *Purchasing agent:* The person responsible for making purchasing and contract decisions has a key role to play in the construction financing process, assisting in selecting outside consultants and managing the process for hiring a construction contractor.
- *Budget officer:* In communities where the budget is developed by an official other than the chief administrator or the finance officer, the person responsible for this function plays an important role in construction finance. The budget officer should take the lead in preparing the capital budget and should be informed of financial proceedings throughout the project, since each has an effect on both current and future budgets.
- *Treatment system manager and operators:* If the community currently operates a treatment system, it is essential that those on the staff (often in the Public Works Department) who are familar with it provide input into the process of building a new facility. The need for their participation in designing the plant is obvious, but they have other roles as well. They may be qualified to review engineering designs and reports and to assist in monitoring financial progress. The manager may be the employee in the best position to serve as the construction manager, who oversees construction and approves all payments (see Chapter IV for a full description of the construction manager's duties). The operating personnel should also play an advisory role in the user charge study process.
- *Construction manager:* The construction manager serves as "construction auditor," providing oversight regarding quality of construction work. His or her functions include certification of the quality of materials used and verification that construction work was properly performed. Additional information can be found in Chapter IV of this handbook and in EPA's *Management of a Construction Project: A Guide for Grantees.*
- *Planners:* The community officials who are responsible for forecasting and planning for community growth play an important role in the capital planning and project planning steps. Their input is crucial to determining the capacity requirements for all future construction projects, including the wastewater treatment facility. They may also possess demographic and economic information that is necessary to evaluate community impacts of the project, ability to repay debt or raise user charges, and so on. This information will be needed both in the planning phase and when user charges are adopted as construction winds down.
- *Attorney:* Whether the community relies on in-house counsel or contracts for legal services, an attorney who is familiar with your government's

powers and legal structure, as well as Federal and State laws, should be an integral part of the planning and implementation team. Some of the areas where legal advice is needed are: determining the legality of various funding sources; reviewing grant agreements and regulations; drafting and approving contracts with outside consultants and with the construction contractor; assisting the bond counsel in preparing documents relating to debt issuance; and preparing the ordinance that implements new user charges.

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***TRAP:** A community that leaves in-house responsibilities to outside specialists loses some of its decision-making power and thereby relinquishes control of the project.*

The assistance of a number of outside specialists is required to effectively structure and market a municipal debt offering. Your community's purchasing agent should direct the effort to select these specialists *competitively* from among those individuals or firms recognized as qualified to perform their respective services. The key participants and a brief description of their functions are provided below.

- *Bond counsel:* The importance of retaining "recognized bond counsel" as soon as a debt offering is contemplated cannot be overemphasized. An attorney or firm is considered to be recognized bond counsel if that person or firm has had extensive experience in providing legal opinions for municipal issues. A listing of recognized bond counsel is provided in *The Bond Buyer's* "Directory of Municipal Bond Dealers in the United States." The legal opinion of recognized bond counsel contributes to the marketability of a debt offering by giving investors assurance that the issue meets certain legal tests.

  Bond counsel's principal functions are: (1) to approve the legal authority of the government to issue the debt; and (2) to certify that interest income on the bonds is exempt from taxation. Typically, bond counsel's role extends well beyond this narrow scope. Other services frequently include:

  - identifying statutory and charter provisions that dictate the way the debt may be structured;
  - drafting original bond resolutions, ordinances, and trust indentures;
  - preparing the notice of bond election (if necessary);
  - reviewing and approving the notice of sale;
  - approving the form of the note or bond; and
  - attending the note or bond closing to ensure that all required documentation is available in proper form.

  Bond counsel's role is extensive, but should be limited to legal considerations. Issues relating to the sizing and structuring of the bond issue, determination of bidding constraints, and timing of the sale should be addressed by the financial advisor or underwriter in consultation with members of the issuer's staff.

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***TIP:** There is no substitute for use of recognized bond counsel in the debt issuance process. There is an excellent chance that the proposed issue will not be marketable without the opinion of recognized bond counsel.*

- *Financial advisor:* The principal function of the financial advisor is to assist the issuer with the structuring and marketing of the debt offering. You should retain an advisor prior to or shortly after selecting a bond counsel. The financial advisor should be involved in the coordination of the new issue with outstanding debt and any other offerings proposed by the capital improvement program.

  The following services are among those provided by the financial advisor:

  - assisting in developing the capital improvement plan, the capital budget and the capital budgeting process;
  - assisting with the decision to issue debt and the type of security: general obligation or revenue debt;
  - determining the structure of the debt and the terms and conditions of sale (including whether or not the issue should be sold competitively or through negotiated sale);
  - developing a schedule for the successful issuance of debt that identifies the individual responsible for the timely performance of each activity;
  - preparing the required disclosure documents;
  - securing municipal debt ratings;
  - promoting the sale (for competitive issues);
  - verifying bids (for competitive issues) and advising on the acceptability of interest rates bid; and
  - providing follow-up information on the results of the sale.

  Just as bond counsel should not be expected to provide financial advisory services, the financial advisor should not be called upon to provide legal advice. The financial advisor will work closely with

bond counsel to ensure that all legal issues are addressed, but a clear delineation of responsibilities is important.

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***TRAP:** If the proposed issue is to be sold through negotiated sale, the firm selected as underwriter should not also serve as financial advisor. The financial advisor's worth is in his or her independence from any financial interest in the underwriting of your debt.*

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***TIP:** Additional financial advice is often available from State agencies and associations of cities or counties. These sources can be useful during the early planning stages, but should not be seen as a substitute for a financial advisor.*

- *Engineering consultant:* (Note: the engineering consultant may also serve as resident engineer and inspector. See "Construction Management Evaluation and Project Management Conference Manual," USEPA, December 1983.) An important step in your community's effort to develop improved wastewater treatment facilities is to work with engineers of the highest caliber, competence, and professionalism. This does not mean that the choice of an engineering firm is limited to large, national, or "big name" companies. Quality engineering assistance is available from many smaller, regional firms all across the country. However, you must take great care in the choice of an engineering firm. The consequences of poor engineering include excessive cost (both capital and operating) and, possibly, the failure of the system to meet pollutant discharge requirements.

  The most significant factor in the choice of an engineering consultant should be the track record of the firm. Your purchasing agent should prepare a Request for Proposals (RFP) (see *Construction Grants 1985* ("CG 85"), USEPA, July 1984.). A significant difference between the engineer's estimated costs and the contractor's actual costs is a negative indication of the firm's ability to protect the interests of the community. All engineering firms responding to the RFP should be obligated to certify the accuracy of these data at the risk of disqualification in the RFP process.

  Prior relationships with engineering firms should not determine the selection of an engineering consultant for a major capital project. The significance of such a major investment virtually demands competitive selection of the consulting engineer to protect the financial interests of the jurisdiction. A century of public procurement history has demonstrated that competitive negotiation is the best technique for choosing the most cost-effective, qualified advisory services. Competitive negotiation for consultants should not be confused with competitive bidding for purchasing goods. In selecting consultants both the cost and the qualifications of each candidate should be included in the evaluation criteria. For information regarding an optional method of procuring engineering services see "CG 85."

- *Paying agent and bond registrar:* Most communities that are regular issuers of debt have already retained the services of a paying agent and registrar, which are usually provided by banks. The services include payment of principal and interest when due on outstanding debt and maintenance of records of ownership for registered bonds. Most relationships for such services are multi-year contracts that specify charges based on the number of transactions performed. Such transactions include interest payment, bond payment, the process of transferring bonds between owners, and related record-keeping.

  Many jurisdictions have served as their own paying agent in the past. Now that Federal law requires the registration of all municipal debt with a maturity of over one year, the paying agent and registrar function is more complex administratively. In order to avoid the increasingly complex duties of paying agent and registrar, issuers should leave these functions to the financial institutions.

- *Underwriters:* The underwriter is the bank or investment banking firm (or group of same) that purchases the debt directly from the issuer and remarkets the debt to the investment public. The underwriting community consists of firms of varying size that specialize in the local, regional, or national debt market. The size of the debt offering being considered will determine where the issuer should look for underwriting services.

  For competitive sale, the underwriter is chosen by specifying the terms and conditions of sale (in the "Notice of Sale") and accepting bids on the issue at a predetermined place and time. The bids are opened

and the issue is awarded to the underwriter offering the lowest interest rate. This method is preferable for nearly all general obligation debt offerings and many simple revenue bond issues. However, if the issue is complex, if it is the first offering of a new issuer, or if it is being sold quickly to take advantage of favorable market conditions, a negotiated sale may be more efficient.

The best method of selecting an underwriter for the negotiated sale of an issue is to develop a Request for Proposals (RFP) that solicits detailed information about the experience each firm has had with the successful marketing of similar issues.

Once chosen, the underwriter will work closely with bond counsel and the financial advisor to develop a structure that both meets the issuer's needs and is attractive to the investment community. (The financial advisor's principal function at this point is to ensure that the emphasis is on the former, rather than on the latter.) Following the structuring of the issue, the underwriter will consult the firm's sales force to determine proposed interest rates for each maturity at which the debt can be sold in the secondary market. The financial advisor will then offer advice on the acceptability of these rates.

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TIP: Care should be taken in the selection of an underwriter to ensure that the firm chosen is experienced in the remarketing of the specific type of debt being offered and is able to reach the market (local, State, or national) in which the debt can be sold most efficiently.

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TIP: In all advisory relationships, the contract should clearly state the scope of services to be provided, the timetable for completion of principal tasks, the basic compensation arrangements, and some understanding of hourly charges for additional work (upon written authorization by the community).

PROJECT PLANNING

If your community will receive an EPA grant, you must complete and submit a facility plan, which determines the facility design that most closely matches your community's needs. Once your State reviewing agency approves the facility plan, you may direct your engineer to begin detailed design work. Even if you will not receive a grant, you are more likely to get the most cost-effective facility by carefully considering available alternatives. The project planning process, whether at the facilities plan stage or in specific design work, consists of estimating and evaluating *both* capital and operation, maintenance, and replacement (OM&R) costs.

Estimating Capital Costs

A typical wastewater treatment system involves a considerable variety of components: sewer pipe, pumps, wiring, and plant, to name a few. The construction activity will frequently involve a main (or prime) contractor and several subcontractors. It is not a simple matter to estimate the cost of construction, and it is an extremely important matter. Disaster can occur unless the actual cost is close to the estimates used to decide whether or not your community can actually afford to build and operate the plant.

It is generally the procedure that the engineering consultant will provide the capital cost estimate. However, the ultimate responsibility to manage the process is yours.

When discussing costs with the engineering firm, insist on cost estimates with an appropriate level of detail. Each major component (treatment plant, sludge handling and disposal, pump stations, interceptor sewers, collection sewers, etc.) should have its own cost estimate. Compare your cost estimates with comparable projects using the same technology by using unit measures such as cost per mile (for sewers), cost per capita (for total system), etc. EPA publishes assistance materials to help you determine cost norms for different types of treatment technologies. The Computer Assisted Procedure for the Design and Evaluation of Treatment Systems (CAPDET) and *Construction Costs for Municipal Wastewater Treatment Plants: 1973-1982* may be particularly useful in this effort. Ask for an explanation of costs that seem out of line (in either direction: high or low).

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TIP: The selection of the wrong technology can be one of the most expensive mistakes a community can make. You must be sure that the technology being considered is the most appropriate (and cost-effective) for its purposes. Alternative treatment and collection technologies should be carefully considered, especially in small communities.

When developing cost estimates and reviewing your engineer's estimates be sure to consider project-related expenditures which are frequently ignored but are very real. Examples include cash-flow financing of Federal, State, and local shares, interest during construction, repayment of loans from other funds, the local share of planning and design costs, legal, financial and other fees (e.g., the cost of printing the **official statement**, printing the bonds, obtaining a credit rating, use of a signature company, financial advisory services, bond counsel, and the bond election), and any other fees which may be applicable in your situation. If you will receive an EPA grant, your engineer should provide an estimate of capital costs that are not eligible for EPA funding.

Estimating Operating Costs

The estimation of the capital cost of a project usually receives a lot more attention than the estimation of its operating costs. The planning and building of a new facility is often viewed by both the community and the engineer as more of a challenge than the actual operation of the facility. The capital cost of a treatment facility generally represents the need to issue debt, which generally involves the legislative body and frequently a vote of the populace. The numbers tend to be large and very impressive; it may be the most costly decision the governing body of your community ever makes.

Notwithstanding these factors that focus attention on capital costs, you should insist during planning and design on an accurate determination of operating costs and a facility that will be simple and inexpensive to operate. An error in the calculation of operating cost can be as much as nine times more costly than the same size error in the capital cost estimate. The reason for this is that capital costs are funded from debt proceeds and repaid over time, as are any errors in capital cost estimates. With a 20-year bond at 10 percent interest, the community pays annual debt service equal to about 11 percent (or one-ninth) of capital costs. In addition, the total capital cost to the community may be reduced by grants from the State or Federal government. Errors in operating cost, on the other hand, are paid for every year—and in full. Thus, an accurate estimate of the annual cost of operating the entire system may be more critical than the estimate of capital cost. EPA publishes *Operation and Maintenance Costs for Municipal Wastewater Facilities* to assist you in evaluating operating cost estimates.

Virtually all your **operation, maintenance, and replacement** (O, M&R) costs will be composed of the following: labor, power, chemicals, sewer maintenance, and billing. Never assume that the operating cost indicated in the facility plan is complete and accurate. Insist on a reevaluation of the operating cost for the entire system and an updating of costs to reflect current prices for labor and materials. You can use the Financial Capability Guidebook produced by EPA to help prepare complete estimates. This caution is particularly appropriate for a facility plan which is for a system expansion, since some engineers will only include cost estimates for the portion of the system being expanded. Don't assume; ask for a statement in writing.

Are the Costs Reasonable?

Once you have determined that the cost estimates provided are complete, you may discover that you are facing a more expensive project than you anticipated. Determining whether such costs are reasonable is not a simple matter, but experience has provided some indicators of situations that deserve closer scrutiny. Your State may have other indicators that can also be used as guidelines.

- Size of community: Small jurisdictions (those with population less than 10,000 and even more emphatically less than 3,500) usually have higher per capita costs than large jurisdictions. As a result, there is less margin for error.
- Extent of sewers: If a community is installing sewers for the first time, that component will generally be a major cost, if not the single largest cost, of the entire system. In fact, small communities often cannot afford both conventional collection and treatment facilities, even with Federal grants.
- Type of technology: For small communities the type of technology can be a major contributor to high cost. In particular, certain types of activated sludge and physical-chemical systems tend to be very expensive and have high O, M&R costs.
- Total capital cost per household (without a grant): If the residential share of capital cost of the project divided by the number of households is greater than $4,000 (for an upgrade or expansion project) or $6,000 (for a new system), then the capital cost may warrant reexamination.
- Total annual cost per household (includes capital cost plus O&M): An annual total cost per household greater than $300 may be a cause for concern. Annual household cost should also be measured against annual household income.
- Allowance for future flow: An allowance for growth of greater than 50 percent may be an indication of over-design, unless the estimate is substantiated by commensurate growth rates in the recent past. A realistic appraisal of your community's growth potential is necessary to determine future flows.
- Capital cost of sewers per household: A per household cost of greater than $4,000 suggests that the project may have excessive sewering.

Preventing Costly Reexamination of Your Project

The following steps should be considered at the initial phase of the project. It is important to note that EPA regulations don't allow for payment of redesign in the event of erroneous initial judgement. Nor will EPA pay for replacement costs of an inappropriate facility. Therefore, the following should be kept in mind in designing your project:

- Review the facility plan and basic design data for cost-saving measures: Consider reducing or eliminating items not essential to operation or safety. Brick-faced buildings, terrazzo floors and paved roadways may do nothing to improve effluent quality.
- Reduce the scope of the work: Consider limiting the service area, especially by eliminating unnecessary sewering through sparsely populated areas. It can be much more cost-effective to rehabilitate or replace existing on-site systems and to establish community-wide management of the systems than to construct sewers. Where current on-site systems will not work, consider rehabilitation or the use of innovative or alternative (I/A) on-site systems.
- Reduce facility size and stage construction: Consider reducing or eliminating the sizing for future growth. Similar results can be achieved by staging construction according to need (when revenues will be available to finance the expansion).
- Reconsider less expensive technologies: Take another look at alternative sewers, cluster systems, trickling filters, lagoons, sand filters, overland flow, oxidation ditches, and low load aeration technology.
- Share support facilities and operations with neighboring jurisdictions: Sharing such costs as labs, maintenance equipment, and supplies can reduce personnel and other cost as well.

It is important to ensure that all simple, low-cost alternatives were considered seriously. Since the most cost-effective alternative may change with time, be cautious about relying on an old facilities plan. EPA regulations now require a reexamination of the environmental impacts of any plan five or more years old. If you intend to apply for an EPA construction grant, you should file the formal grant application when you have completed detailed design work. Once your application is approved and a grant awarded, you will need to complete preconstruction activities so that you can begin construction as soon as possible.

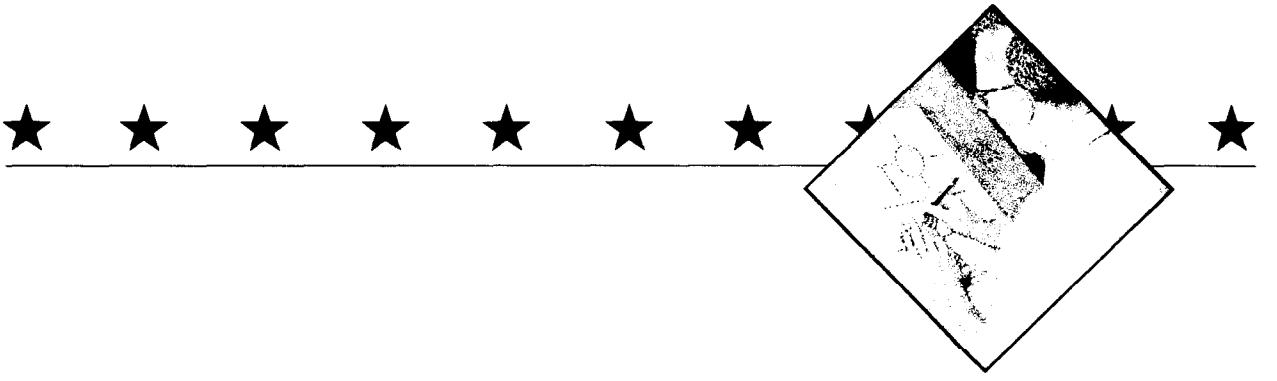
CONCLUSION

Exhibit 3 reviews the functions performed in the planning process. At this stage, you are standing safely on first base. You have stepped back to evaluate all of the legal and regulatory restrictions that you face and have taken steps to comply with each. You have completed an analysis of all of your community's capital needs and the available financing. You have developed plans for your project, including how it will be built, whether it is appropriate for your needs, what it will cost, and how long it will take. You are ready to head for second by:

1) lining up short-term financing;
2) designing the long-term financing;
3) awarding the construction contract;
4) preparing the project budget;
5) developing the cash-flow forecast; and
6) beginning a user charge study.

Exhibit 3

Matrix of Functions Performed in the Planning Phase



What is Done	*Who Does it*	*When*	*To and With Whom*
UNDERSTANDING GROUND RULES	Community's Attorney	As soon as construction is contemplated	All employees who will be involved
CAPITAL PLANNING	Budget Officer	Annually	Department Heads, Chief Administrator
ASSEMBLING YOUR TEAM	Chief Administrator	As soon as construction is contemplated	Legislative Body
PROJECT PLANNING	Engineer	When needs are identified	Operating Manager, other internal team members
OVERALL PROJECT MANAGEMENT PLANNING	Project Manager	Throughout the project	All team members involved in this phase

CHAPTER III

The pre-construction phase of financial management: moving to second

With the planning process complete, you have made an important first step toward your goal of successfully building a treatment system; you now have an understanding of the legal issues, a capital plan, a team in place, and a design for the facility underway. Before you move into scoring position and are ready to build, however, you must do some more preliminary work in the pre-construction phase. This work will consist of selling short-term notes so that you will have adequate cash to pay the costs of construction, designing the features of your permanent financing, developing a construction contract, preparing a project budget and cash flow forecast, and beginning a study to set new user charge rates.

SHORT-TERM FINANCING

While it is difficult to make statements applicable to all situations, it is generally the case that a local government will finance a capital project with a combination of short-term and long-term debt. Short-term debt instruments (typically Bond Anticipation Notes (BANs) or Grant Anticipation Notes (GANs) are used to provide cash-flow financing during the construction period and long-term debt is used to provide permanent financing once the actual cost of the project has been established. Alternatively, local governments may issue long-term debt after accepting bids on construction contracts and thus avoid the need to secure interim financing.

This subsection focuses on structuring an interim financing program that provides funds when needed to meet construction costs and takes full advantage of legally authorized reinvestment earnings. The process for arranging permanent financing is described later in this Chapter and in Chapter V. You are cautioned to undertake short-term borrowing only after careful planning and with the full advice and consent of bond counsel.

Short-Term Financing Alternatives

For wastewater treatment facilities, various forms of short-term financing methods are available. Your community may consider the issuance of **bond anticipation notes** (BANs), grant anticipation notes (GANs), or some combination of the two.

BANs are issued in anticipation of permanent financing of the project which will occur at some later date through the sale of bonds. Security for the BAN is provided by the issuer's ability to access funds in the credit markets by selling general obligation or revenue bonds. Thus, to ensure a favorable reception by investors, all legal requirements for the *long-term* financing must be satisfied before the BANs are authorized and marketed. For a general obligation bond issue, this typically means securing voter approval. When the permanent financing is to be provided from revenue bonds, a feasibility study, projections of revenue flow, and other forecasts of project viability are required. The investor in the BANs wants to be sure that the bonds that secure his investment can and will be issued as scheduled.

As the name implies, GANs are a short-term instrument secured by the expected receipt of grant funds. Such notes are a viable financing alternative only when the issuer has received a firm commitment that the grant will be made. GANs may be secured either by EPA grant, State grants, or both.

Because GANs are secured by the receipt of the grant for wastewater treatment, care must be taken to accurately estimate grant-eligible costs. A conservative approach is important in developing this estimate. Once expenditures have been made for grant-eligible **expenses**, you apply to EPA for reimbursement. Assuming all required procedural steps have been followed, EPA will usually provide reimbursement within thirty days.

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***TIP:** It is essential that grant receipts be segregated in a separate fund or account to provide for redemption of the GANs upon maturity. Most issuers enter into trust agreements that give note investors comfort that the funds will not be diverted to any other purpose. One community that failed to understand the segregation requirements of its note indenture placed too little money in the redemption fund and defaulted on its notes.*

GANs and BANs issued for wastewater treatment construction financing usually mature within 18 to 36 months of the date of issue. In some cases, governments will issue notes for a period shorter than is necessary for completion of construction and then reissue or "roll-over" the notes at maturity. This approach takes advantage of the lower interest rates on short **maturities**, but exposes the issuer to some risk that rates will be higher on the roll date (plus the added costs of multiple issues). Your financial advisor and bond counsel should be consulted regarding a note structure that is appropriate to market conditions at the time of sale.

Arbitrage Earnings During Construction

An appreciation of the financial advantage of interim financing requires an understanding of the concept of **arbitrage**. In the municipal market, arbitrage refers to the reinvestment, at taxable interest rates, of funds that were borrowed at lower tax-exempt interest rates.

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***TRAP:** In most cases arbitrage earnings are subject to strict limitation by regulations of the Internal Revenue Service. Because violation of these regulations can result in the loss of tax-exempt status, it is important that bond counsel be involved in the sizing and structuring of any note or bond offering (as well as the proposed reinvestment schedule).*

If the issuer is to take full advantage of the arbitrage earnings short-term borrowing allows, accurate estimates of total project costs and the construction disbursement schedule are essential. The engineering consultant, in conjunction with the prime contractor, should provide a detailed (at least monthly) statement of expected cash flow and estimates of Federal (and, if appropriate, State) reimbursements. These statements should be examined with great care to guarantee that funds will always be available to make required payments—including those for BAN interest should the term of the financing be less than the duration of the construction phase.

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***TRAP:** The grant funds must be available by the stated maturity date of the GANs. To ensure their availability, the issuer must take into account the delays between approval of a construction expense and receipt of funds from the EPA.*

Exhibit 4

Construction Draw-Down and Interest Earning Schedule
for a $5,000,000 Project
Over a 12-Month Construction Period

Construction Fund			Debt Service At 6%	Earnings on Const. Fund at 7.5%	Net Debt Service
Month	Balance	Expenses			
0	$5,000,000	$ 0	$ 0	$ 0	$ 0
1	5,000,000	100,000	0	0	0
2	4,900,000	200,000	0	30,625	0
3	4,700,000	400,000	0	29,375	0
4	4,300,000	500,000	0	26,875	0
5	3,800,000	700,000	0	23,750	0
6	3,100,000	900,000	0	19,375	0
7	2,200,000	900,000	0	13,750	0
8	1,300,000	600,000	0	8,125	0
9	700,000	300,000	0	4,375	0
10	400,000	200,000	0	2,500	0
11	200,000	100,000	0	1,250	0
12	100,000	100,000	300,000	625	139,375

The disbursement schedule shown in Exhibit 4 is fairly typical for a major capital construction project. In this case a 12-month construction period is assumed. Assuming the **net interest cost** of the one-year note issue is 6.00 percent, the total interest payments are $300,000. By reinvesting the note proceeds in taxable securities (at an assumed average rate of 7.5 percent) until needed to meet construction expenses, the issuer is able to off set its interest costs and reduce the effective rate of the borrowing. The net effect in the example shown is to reduce debt service from $300,000 to $139,375.

Advantages of Short-Term Financing

Using temporary financing during the construction phase of a project followed by permanent financing offers several advantages. Since BANs are usually paid for by either the sale of a new issue of notes or by the sale of long-term debt, their use allows the deferral of principal payment. If a new system is being constructed, this matches the greatest burden of debt service with the revenue flow from benefiting users.

During periods of high interest rates, BANs (which have low interest cost relative to long-term debt) can be used to defer the long-term financing until rates have declined. Unfortunately, there is no guarantee that rates will decline, so the use of BANs for this purpose constitutes a risk as well as an opportunity.

Issuing BANs also allows the amount which must be permanently financed to be determined exactly. Long-term financing before completion of construction may result in additional financing later if cost estimates were not accurate. This can be both embarassing and costly.

If a wastewater system is being constructed with revenue debt, the community may need to defer debt service payments until the new plant is operational. Under these circumstances, an interim borrowing, in the form of BANs and GANs, is appropriate. A second option would be to sell bonds that are structured to defer the first principal payment until after project completion. In this case, enough money is borrowed to pay interest on the bonds during construction. This amount is known as capitalized interest.

The process outlined above is complicated and extremely important. In general, it is highly advisable that the community employ the services of an independent financial advisor (an expert who has no financial involvement in the way the interim borrowing is structured) to coordinate the various steps and offer objective advice about the method of funding which is in the best interest of the community.

DESIGNING THE BOND ISSUE

As noted above, you must make some decisions about how you will finance the project in the long-term before you can arrange short-term financing. Once you have received the proceeds from short-term financing, you can complete the design for your long-term issue. Exhibit 5 shows that the design phase is just one of the three distinct parts of the bond sales process. It is also the only one that usually takes place before construction. The other phases, marketing and closing, are discussed in Chapter V.

Designing the Issue

The first decision in designing the bond issue is the type of bond (general obligation or revenue). In a well-managed agency, this decision will be made in the capital planning process, well before construction is underway. (See Chapter II for an outline of factors that should be considered in determining bond types.) No interim or construction financing can be marketed effectively until the form of the long-term or permanent financing has been determined.

One of the most important activities, undertaken early in the process, is the sizing of the bond issue. The simplest method is to borrow the amount of construction costs, less grants from EPA and the State, upfront cash, and other funding sources. Municipalities may also choose to capitalize, or include in the amount to be borrowed, the costs of issuing bonds (bond counsel, printing, insurance, etc.) and the interest on short-term financing. A financial advisor can help determine what costs should be capitalized, if any.

The term of the bonds, or numbers of years until they mature, must also be determined.

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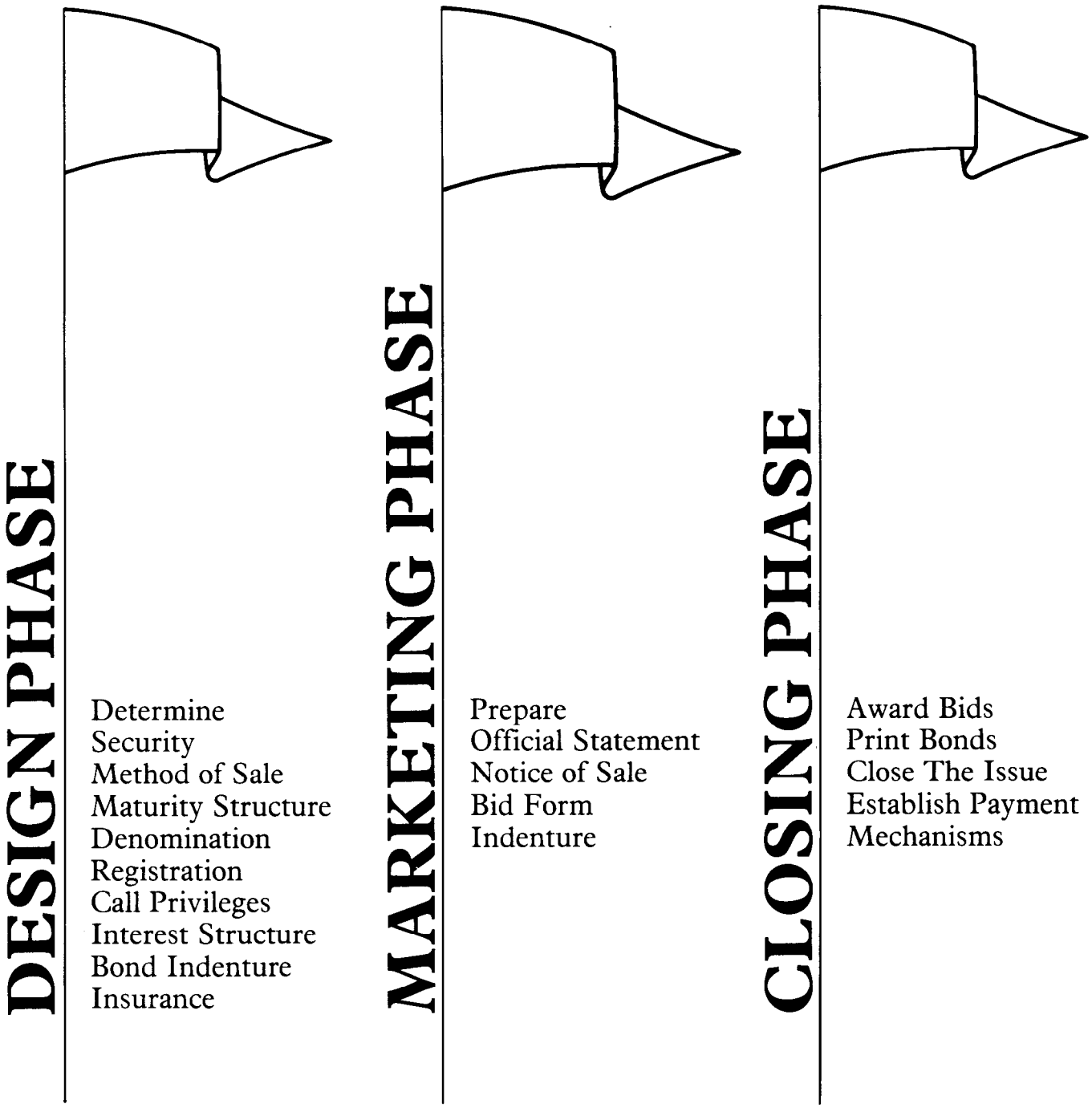
***TIP:** The term of the bonds should never exceed the expected useful life of the facility. If it does, you may end up paying debt service on two bond issues for the same purpose. This is a particular concern where 40-year loans are used. With this in mind, you have some flexibility in selecting a term that closely matches the desired cash-flow pattern.*

You should keep in mind that while shorter terms generate lower interest rates and total interest payments, they result in higher annual payments. Ten- and twenty-year bonds are most common for treatment facilities, but thirty-year bonds may be considered where the annual debt service costs of shorter term bonds are too high for the community to bear.

Exhibit 5

The Bond Sale Process



You must also determine the method by which the bonds will be sold. Virtually all debt is sold through either competitive or negotiated processes. In a competitive sale, the issuer selects a sale date and solicits sealed bids. Bids are opened on the specified date and the bonds are sold to the bidder who offers the lowest total interest cost. In a negotiated sale, the issuer selects one bank or investment banking firm and then negotiates the interest rate and other terms of the sale. State laws usually govern which method may be used, with most States requiring that G.O. bonds be sold competitively. Generally, competitive sales are more advantageous to the issuer.

Once the basic structure of the issue is determined, the finance officer and financial advisor must determine the other aspects of the sale:

- Method of retirement (maturity structure): Most bonds issued by local governments are **serial bonds**. In this type of bond structure, a portion of the principal is retired each year, along with the regular interest payment. The structure that is most appropriate for revenue-supported debt is serial bonds with equal debt service payments. The principal payment increases each year and interest declines so that annual principal and interest payments are approximately equal, not unlike a mortgage on a private home (with the significant difference that bond payments are made semi-annually, with the principal component usually being paid on only one of the semi-annual dates). Many municipalities prefer this schedule because the taxes or fees levied to repay them can be held constant each year. Unlike serial bonds, **term bonds** are retired at a single, future maturity (or at specific dates during their life) from **sinking funds** accumulated during the life of the bonds.
- Denomination: This is the face amount (or par value) of each bond that the issuer promises to pay on the date the bond matures. It is common for bonds to be issued in multiples of $5,000.
- Registration: Current Federal law *requires* that issues with a maturity of longer than one year be registered. The owner's name is listed in the books of the bond paying agent and registrar (and the issuer, if the issuer is acting as co-registrar). Interest payments are sent automatically to all registered owners when due. Prior to 1983, most municipal bonds were issued in bearer form. Under this system, there was no record of bond ownership; payments were made only when bonds and interest coupons were presented to the paying agent by the owner.
- Call privileges: A bond that is callable may be retired before the maturity date at the option of the issuer. Usually this feature is considered when interest rates are high. For the issuer, it has the advantage of reducing debt levels if revenues are higher than predicted at the time the bonds were sold.
- Interest structure: Interest payments are usually made twice a year until the bond matures, as specified on the successful bid for the bonds. The rates may vary (if State law permits) depending on length of maturity. The issuer may wish to restrict the number of different interest rates and the maximum range of rates to permit on bids; this decision should be made following consultation with the financial advisor.
- **Bond indenture** (for revenue bonds only): Because they rely on restricted funds rather than a general pledge of the issuing government, nearly all revenue bonds are subject to special agreement between the investor and the issuer. This agreement (known as an indenture) often includes a requirement that bond funds be held in a special fund to guarantee that the funds are kept separate from operating funds. The manner in which the bond funds may be used, requirements to build cash reserves, and how **operating income** from the facility should be handled are spelled out in the trust indenture in great detail. A financial advisor and a bond counsel will be needed in this part of the design process.

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***TIP:** Bond indentures frequently require that funds be reserved in separate accounts throughout the life of the bonds in order to provide additional protection for the bondholder. Excessive segregation of funds may lead to significant inflexibility, possibly resulting in an inability to legally pay legitimately incurred costs despite the availability of cash in other accounts. An appropriate minimum number of funds is two, one for operating and maintenance expenses and one for debt redemption.*

- Insurance: An increasing number of municipal bond issues are insured. In this arrangement, the issuing agency pays a fee (generally one-half to one and one-half percent of the total debt service on the issue) to purchase insurance to pay off the bonds should the issuer be unable to do so. The presence of insurance results in a better bond rating and lower interest costs. Bond insurance is often difficult to obtain for revenue bond issues.

THE CONSTRUCTION CONTRACT

The construction contract is your best chance to guarantee that the job will be done right. Your purchasing agent, engineer, and attorney should work to ensure that it includes adequate protections. Much of

the contract will focus on the physical aspects of the job. These most important items must be incorporated into a Statement of Work that describes in detail what is expected of the contractor, and a schedule that sets out in objective (measurable) form what will be done by what date.

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TRAP: *Too often, construction schedules are vague, containing deadlines for amorphous events such as "25 percent completion." These schedules are open to interpretation and leave the community with little hope for enforcement. Schedules should relate to specific, measurable events, such as "complete excavation as described in Section 4.15 of the specifications," "install and test sewer lines on Main Street," and the like.*

In addition to these "physical" contract provisions, the contract must have some financial provisions as well. The most important are:

- Payment provisions: The contract should state how often the contractor will be paid and how the payment will be measured. It is to the community's advantage for the purposes of cash-flow forecasting to state a specific, monthly date for the contractor to submit bills and a minimum time for the community to review the submission before payment. (Ten days is probably an appropriate review period, but you should agree on a period with your engineer.) The contract should specify that monthly payments will be based on the contractor's claim of progress toward completing the construction schedule (on a percentage basis) and that payment will not be made until both the engineer and the construction manager certify that the contractor's estimate is accurate. The contract should also state that payment requests must be accompanied by written progress reports that support the request.
- Retainage: Since every construction project requires some modifications and correction in the period between completing the project as scheduled and final acceptance, the community should incorporate in the contract a provision to retain from each payment a percentage to be held until final acceptance. Retainages commonly run from five to ten percent of each payment. Once the contractor submits a final bill, the retainage should be held until the finance officer receives written certifications from the engineer and the construction manager that the project is acceptable and that retainage may be released. It is important to note that EPA grant recipients may only request payment from EPA for costs *actually* incurred. Therefore, until the retainage has been paid to the contractor, the grant recipient should not seek reimbursement from EPA for that amount.
- Performance bond: The contractor is required to post a performance bond at its own expense in the amount of the contract. A performance bond is an insurance policy that guarantees completion of the job. If the contractor fails to complete the contract, the community may demand that the insurance company either find another acceptable contractor or pay the community the value of the uncompleted part of the project. Do not allow any work to be done by the contractor until a performance bond is presented.

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TIP: *Keeping good records is absolutely essential to a successful project. Both you and your contractor are required to maintain proper records. Millions of dollars of project costs have been disallowed by EPA due to poor or incomplete record keeping on the part of project managers or contractors, or both. See "EPA Office of Inspector General Report to Congress," USEPA, Fiscal 1985.*

EPA requires that every contract contain certain fundamental clauses. Refer to the model clauses in 40 CFR 1030, or use your own equivalent clauses to cover the required contract clauses. Some of the matters covered include:

- Change orders: The dollar value of the contract will initially be for the competitively established price of the contract awarded to the low bidder. During the actual construction period, however, it may be necessary to make changes that result in a higher price. Your contract should specify a routine for dealing with change orders. You should require that the engineer describe and justify each change order and that the construction manager *and* the legislative body approve it. (See *Management of Construction Change Orders,* USEPA, March 1983.)
- Termination: The contract should clearly state how the community may terminate the contract. You should reserve termination rights both in the event that the contractor fails to meet the provisions of the contract (see "default" below) or simply for the convenience of the community. This last provision is most commonly used when there is a problem with continued financing for the project. The termination provision should clearly state how the community will notify the contractor of termination and how the work to date will be measured for the purpose of payment.

- Default: The contract should clearly define the conditions under which it may find the contractor "in default" for the purposes of withholding payments or terminating the contract. Common causes of default are failure to deliver materials or services on schedule, delivering materials that do not meet the specifications, or failing to meet reporting requirements.
- Audit; access to records: The contract must contain a provision requiring your contractor to maintain books, records and other evidence pertinent to performance on EPA funded works. The prime contractor must, in turn, make this provision applicable to all subagreements he awards in excess of $10,000. The right of access clause applies to financial records pertaining to all subagreements, except formally advertised, fixed-price subagreements, and to all subsequent change orders and subagreement amendments.

It is crucial for EPA grant recipients to be aware of and refer frequently to the EPA regulations governing construction contracts. In addition to *Construction Grants 1985*, you should obtain copies of the *Audit Access to Records: 40 CFR 33.1030 (9); Prevention and Resolution of Contractor Claims: EPA Construction Grant Program Guidance for Municipal Grants,* USEPA, March 1985; *Construction Grants Program for Municipal Wastewater Treatment Works: Handbook of Procedures,* USEPA, October 1984; and *Management of Construction Change Orders: A Guide for Grantees,* USEPA, March 1983. EPA regulations and most State laws require that the construction contract be let through the process of competitive bidding. This process consists of these major steps:

- Preparing bid documents: EPA procurement regulations (40 CFR Part 33) require that bid documents include a complete statement of the work to be performed, including design drawings, specifications, and performance schedule. They should also include the terms and conditions of the contract to be awarded, including payment and delivery schedules, and a clear explanation of the bidding procedures and evaluation process. The statement of work and detailed plans and specifications represent your order for work to the contractor. They must be carefully crafted to tell all potential bidders the complete story of what you will be expecting from them.

  The financial and administrative aspects of the bid documents should be carefully reviewed. The contract must specify the method and procedure for payment. You can avoid the potential for contractor claims by stating clearly in the contract documents how often and through which means the contractor will be paid.

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***TIP:** Contract specifications should be of a performance nature, stating what is to be done, but not how it is to be done. This leaves the potential contractors the freedom to plan the day-to-day operation in whatever way they feel is best, while you still have a control over the exact character of the final product.*

- Advertising for bids: In addition to the EPA regulations, State laws may specify some minimum requirements for advertising the bid. You should meet this minimum, and it is generally to your advantage to exceed it. Advertisements should be placed in the local newspaper, any newspaper that serves nearby cities, and any newspaper that is known to be read by construction contractors (e.g., a journal of commerce). Bid documents should be provided to any potential bidder who responds to the advertisement.

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***TIP:** You should hold a pre-bid conference two or three weeks after the advertisements have appeared in order to answer questions about the bid documents. Attendance at this conference is recommended for anyone who wishes to submit a bid, so that all bidders receive the same information. The minutes of the conference should be made available to all bidders. Similarly, if you or your engineer answer questions about the bid documents over the telephone, you should send letters summarizing all questions and answers to all potential bidders.*

- Evaluating bids and awarding the contract: Your bid documents and advertisement must state a specific date, time, and place for bids to be delivered. You should open them at the advertised time and place and read the bids to all present. This should be your last public statement until you are ready to award the contract. Your next task is to work with your engineer to determine the "lowest responsive and responsible bidder." "Responsive" bidders are those who bid the job in conformance with the bid documents, meeting the specified schedule, indicating acceptance of contract provisions, stating a firm price, accepting responsibility for project quality, and so forth. "Responsible" bidders are those who indicate that they have adequate staffing, equipment, and experience to complete the job correctly and on time. Your bid documents should

state clearly any definitive criteria you will use to judge responsibility, using measures such as years of experience in similar jobs of the person who will be primarily responsible for the job, references from other communities for which the contractor has done work, and equipment owned or leased by the contractor. Once you have determined each bidder's responsibility and responsiveness, you award the contract to the bidder who submits the lowest total price of all those who meet both standards.

THE PROJECT BUDGET

Once the construction contract is awarded, the community is able to prepare a final project budget for the construction period. (A preliminary estimate should have been developed in your facility plan or annual capital budget.) It should cover all project-related resources and outlays from the time the construction contract is signed until permanent financing is secured.

A project budget is a plan of how the community will raise funds for the project and how it will spend them to reach the goal of a completed facility. It is, therefore, the key planning and control document for the rest of the process. The chief administrator and finance director will prepare two budget breakdowns — one for inflows, or "sources," of funds and one for outlays, or "uses." Note that the terms sources and uses include more than the traditional budget classifications of "revenues" and "expenditures;" they also include proceeds from debt financing and repayment of debt principal. This approach gives a more complete picture of the financial transactions relating to the project and assists in cash-flow planning. The sources and uses budgets should each be further broken down into budgets for those items that are eligible for EPA grant funding and those that are not. For example, EPA may not pay for solutions to aesthetic problems that raise the cost of the project, costs of furnishings, bond issuance costs, and so forth. Exhibit 6 is a sample project budget.

The sources budget should list a forecast of revenue from all sources that will be used to pay for the construction cost of the project as well as items that are not technically revenue, such as proceeds from short-term notes. Note that Exhibit 6 separates true revenues from other sources of funds. Typical sources include connection fees, EPA and State grants, proceeds from notes, proceeds from permanent financing, interest on cash balances, and contributions from capital reserve funds. For some sources, you will be able to budget very accurately (e.g., EPA grants and capital reserve contributions). For others, such as interest earnings and connection fees, a very conservative "best-guess" estimate will be required. Note that many communities are authorized to sell both notes and bonds at a discount from their face value so the community may receive less in proceeds than expected. One community relied on its engineer's estimate of the note discount and received considerably less than it budgeted. Your financial advisor should help estimate all sources and uses relating to debt issuance.

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***TRAP:** One common cause of shortfalls during construction is overly optimistic budgeting. This is particularly true in the sources side, where you must anticipate future developments (i.e., number of connections, interest earnings, etc.). Communities that have run out of funds in the construction phase have often been guilty of optimistic budgeting, particularly in these items:*

- *interest earnings during construction,*
- *proceeds from short-term financing,*
- *items eligible for EPA grant funding,*
- *costs of issuing debt, and*
- *construction costs.*

Once total sources of funds are identified, each source should be divided between funds to be used for EPA eligible costs and funds for ineligible costs. Eligible costs are those that may be paid for in part with an EPA grant. Ineligible costs must be paid from local resources. If your community is not receiving an EPA grant, there is no need to make a distinction between eligible and ineligible costs. At the end of this exercise, you will have a detailed breakdown of total sources of funds and of sources for eligible and ineligible costs.

Budgeting for uses of funds is often more difficult and time-consuming than budgeting for sources. Many costs of construction and financing may be overlooked and they are often difficult to estimate or control. Regardless, the general approach is quite similar. It is important to develop an estimate of each cost item and then determine whether it is eligible for EPA grant assistance. This budget can be compared to the budget for sources. These two budgets must balance, both for total and for eligible costs. If uses exceed sources, either the project must be reduced in cost or the community must borrow more money.

Individual expenses, or uses, of funds are commonly called "line-items." Some of the line-items that must be included in the project budget are obvious; payments to the engineer and to the construction contractor are usually two of the largest. There may also be other line-items relating to construction; for example, purchase of land and payment of salaries of community employees

Exhibit 6

Project Budget

Sources	Eligible	Ineligible	Total
Permanent Financing			
EPA Grant	$ 3,500,000	$ 0	$ 3,500,000
State Grant	300,000	38,500	338,500
Capital Reserves	75,000	75,000	150,000
Interest Earnings	345,000	22,300	367,300
Bonds	2,495,000	98,000	2,593,000
Total Perm. Financing	$ 6,715,000	$233,800	$ 6,948,800
Proceeds from Notes			
Grant Antic. Notes	$ 3,500,000	$ 0	$ 3,500,000
Bond Antic. Notes	2,300,000	78,000	2,378,000
Total Proceeds	$ 5,800,000	$ 78,000	$ 5,878,000
Total Sources	**$12,515,000**	**$311,800**	**$12,826,800**

Uses	Eligible	Ineligible	Total
Permanent Outlays			
Engineering	$ 445,000	$ 12,300	$ 457,300
Construction	5,295,000	185,100	5,480,100
Proj. Mgmt.: In-house	24,000	3,000	27,000
Short-term Interest	360,000	9,700	369,700
Issuance Costs-Notes	12,100	3,200	15,300
Issuance Costs-Bonds	36,900	1,300	38,200
Contingency	542,000	19,200	561,200
Total Permanent Outlays	$ 6,715,000	$233,800	$ 6,948,800
Repayment of Notes			
Bond Antic. Notes	$ 2,300,000	$ 78,000	$ 2,378,000
Grant Antic. Notes	3,500,000	0	3,500,000
Total Repayment	$ 5,800,000	$ 78,000	$ 5,878,000
Total Uses	**$12,515,000**	**$311,800**	**$12,826,800**

who will perform work. There are some related costs that are frequently overlooked: building and other permits, staff costs for project supervision, costs relating to issuance of short- and long-term debt, such as charges for bond counsel, financial advisor, interest expense, bond ratings, and the like. The engineer and construction manager should work together to develop a comprehensive list of construction uses, while the financial advisor can provide a list of budget estimates for uses relating to financing. As in the case of sources of funds, the budget for uses should be conservative. On the uses side, this means estimating those costs that are not known exactly a little higher than you expect.

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***TIP:** Always include a "contingency" line-item in your budget of uses of funds. There are likely to be change orders in the construction process and other costs that you either underestimated or failed to consider at all. At the time of preparing a budget and cash flow forecasts, a common contingency for construction projects is ten percent.*

THE CASH-FLOW FORECAST

Once the budget is completed, the community has a plan and a means of controlling both incoming and outgoing funds during the construction process. The budget will be used during construction to give an idea of whether the project is heading for trouble, with spending exceeding the budgeted amount or revenues falling short. A cash-flow forecast is another essential control tool. Its purpose is to forecast the cash balances during the project, helping to determine whether the project funds and bank accounts will have adequate balances to pay bills during the construction period. It also provides a guide for investing **fund balances** during construction.

Exhibit 7 represents a cash-flow forecast based on the budget developed in Exhibit 6. It demonstrates how available funds (sources) may be drawn down during a typical construction project (uses). For each month, uses are deducted from sources to demonstrate the community's cash position.

The cash-flow forecasting process is best thought of as breaking the detailed budget down further into a budget for shorter time periods within the process. The major difference is that the budget will not be in balance for each time period; however, with good project and financial planning, the balance will be positive until the project is complete.

When preparing the budget, each source or use of funds was broken down only into categories of eligible and ineligible costs, to ensure that each category had a balanced budget. In preparing the cash-flow forecast, it may be necessary to break the sources and uses down further by determining which project account or fund they will affect. Without short-term financing, the project may only require one account for all activities. Short-term financing frequently complicates matters further. Note indentures frequently require additional accounts for items such as note interest payment, payment of issuance costs, and so forth. Exhibit 7 shows a simple fund breakdown in which construction is accounted for in one fund and transactions relating to the short-term notes in a second fund. The town's note indenture requires that the EPA grant payments and payments and proceeds from bonds be placed in the note redemption fund, which may only be used to pay note interest and principal. Note that this forecast assumes the "contingency" item is spent uniformly over time. While this is rarely the case, this method is more conservative than assuming that the contingency will either not be used at all or will not be used until the end of construction.

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***TIP:** It is important to forecast and track the account balances for* every *one of the accounts because you must maintain a positive balance in each one. If the community overdraws the account for construction, it will be barred from paying construction bills from other accounts by legal and investor restrictions. It will, in effect, be unable to pay its contractor.*

Once each source or use of funds is assigned to a specific fund or account, it must also be broken down by time period. Tracking cash flow by monthly periods is generally adequate, particularly if most payments of construction costs and interest costs are made regularly each month. You should determine the total time the project will take and lay out a worksheet that lists every month until completion. Next, estimate when each source of funds will be received. For some, such as proceeds from notes, there will only be one receipt and for others (e.g., interest earnings, grant payments) there will be more than one. Once again, conservatism is important; it is best to assume that grant payments and other sources will be delayed beyond the bare minimum, thus leaving a margin for error. Uses of funds are also broken down by time period. Payments to the engineer and contractor may be estimated from the construction schedule, payments of interest will be known once notes are sold, and the financial advisor can help estimate the timing of issuance costs.

Exhibit 7

Project Cash-Flow Forecast

Construction Fund	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Beginning Balance	**$ 0**	**$5,606,700**	**$5,007,700**	**$4,392,400**	**$3,665,100**	**$2,976,800**
Sources						
State Grant	0	21,000	24,000	30,000	33,000	35,000
Capital Reserves	150,000	0	0	0	0	0
Interest Earnings	1,000	43,000	40,000	35,000	29,000	22,000
Grant Antic. Notes	3,500,000	0	0	0	0	0
Bond Antic. Notes	2,378,000	0	0	0	0	0
Total Sources	$6,029,000	$ 64,000	$ 64,000	$ 65,000	$ 62,000	$ 57,000
Uses						
Engineering	$ 125,000	$ 38,000	$ 35,000	$ 37,000	$ 32,000	$ 30,000
Construction	235,000	577,000	595,000	688,000	651,000	876,100
Proj. Mgmt.: In-house	2,000	2,000	2,300	2,300	2,300	2,300
Issuance Costs—Notes	15,300	0	0	0	0	0
Issuance Costs—Bonds	0	0	0	0	0	0
Contingency	45,000	46,000	47,000	65,000	65,000	65,000
Total Uses	422,300	663,000	679,300	792,300	750,300	973,400
Ending Balances	**$5,606,700**	**$5,007,700**	**$4,392,400**	**$3,665,100**	**$2,976,800**	**$2,060,400**

Note Redemption Fund	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Beginning Balance	**$ 0**	**$ 0**	**$ 206,000**	**$ 602,200**	**$1,019,800**	**$1,472,800**
Sources						
EPA Grant	0	205,000	395,000	414,000	445,000	390,000
Interest Earnings	0	1,000	1,200	3,600	8,000	11,700
Bonds	0	0	0		0	
Total Sources	$ 0	$ 206,000	$ 396,200	$ 417,600	$ 453,000	$ 401,700
Uses						
Short-term Interest	0	0	0	0	0	184,850
Bond Antic. Notes	0	0	0	0	0	0
Grant Antic. Notes	0	0	0	0	0	0
Total Uses	0	0	0	0	0	184,850
Ending Balance	**$ 0**	**$ 206,000**	**$ 602,200**	**$1,019,800**	**$1,472,800**	**$1,689,650**

Exhibit 7

Project Cash-Flow Forecast (Continued)

Construction Fund	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total
Beginning Balance	*$2,060,400*	*$1,395,100*	*$ 925,400*	*$ 499,200*	*$ 253,600*	*$ 132,600*	*$ N/A*
Sources							
State Grant	*35,000*	*37,500*	*35,000*	*35,000*	*35,000*	*18,000*	*$ 338,500*
Capital Reserves	*0*	*0*	*0*	*0*	*0*	*0*	*150,000*
Interest Earnings	*18,000*	*10,100*	*7,100*	*4,000*	*1,800*	*1,600*	*212,600*
Grant Antic. Notes	*0*	*0*	*0*	*0*	*0*	*0*	*3,500,000*
Bond Antic. Notes	*0*	*0*	*0*	*0*	*0*	*0*	*2,378,000*
Total Sources	*$ 53,000*	*$ 47,600*	*$ 42,100*	*$ 39,000*	*$ 36,800*	*$ 19,600*	*$6,579,100*
Uses							
Engineering	*$ 30,000*	*$ 35,000*	*$ 32,000*	*$ 33,300*	*$ 18,000*	*$ 12,000*	*$ 457,300*
Construction	*621,000*	*425,000*	*389,000*	*214,000*	*123,000*	*86,000*	*5,480,100*
Proj. Mgmt.: In-house	*2,300*	*2,300*	*2,300*	*2,300*	*2,300*	*2,300*	*27,000*
Issuance Costs—Notes	*0*	*0*	*0*	*0*	*0*	*0*	*15,300*
Issuance Costs—Bonds	*0*	*0*	*0*	*0*	*0*	*38,200*	*38,200*
Contingency	*65,000*	*55,000*	*45,000*	*35,000*	*14,500*	*13,700*	*561,200*
Total Uses	*718,300*	*517,300*	*468,300*	*284,600*	*157,800*	*152,200*	*6,579,100*
Ending Balances	***$1,395,100***	***$ 925,400***	***$ 499,200***	***$ 253,600***	***$ 132,600***	***$ 0***	***$ N/A***

Note Redemption Fund	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total
Beginning Balance	***$1,689,650***	***$2,178,850***	***$2,520,850***	***$2,801,150***	***$3,059,250***	***$3,301,550***	***N/A***
Sources							
EPA Grant	*476,000*	*321,000*	*258,000*	*234,000*	*217,000*	*145,000*	*3,500,000*
Interest Earnings	*13,200*	*21,000*	*22,300*	*24,100*	*25,300*	*23,300*	*154,700*
Bonds	*0*	*0*	*0*	*0*	*0*	*2,593,000*	*2,593,000*
Total Sources	*$ 489,200*	*$ 342,000*	*$ 280,300*	*$ 258,100*	*$ 242,300*	*$2,761,300*	*$6,247,700*
Uses							
Short-term Interest	*0*	*0*	*0*	*0*	*0*	*184,850*	*369,700*
Bond Antic. Notes	*0*	*0*	*0*	*0*	*0*	*2,378,000*	*2,378,000*
Grant Antic. Notes	*0*	*0*	*0*	*0*	*0*	*3,500,000*	*3,500,000*
Total Uses	*0*	*0*	*0*	*0*	*0*	*6,062,850*	*6,247,700*
Ending Balance	***$2,178,850***	***$2,520,850***	***$2,801,150***	***$3,059,250***	***$3,301,550***	***$ 0***	***N/A***

Once each source and use has been forecast by time period, it is a relatively simple matter to forecast a cash balance for each account at the end of each time period. Simply add the beginning balance for the period to all sources to be received during the period, then subtract the uses for the period. It will be helpful in monitoring cash flow to develop a summary table of the forecast that only shows the forecast balance of each account at the end of each month. Exhibit 8 is the summary table for the forecast shown in Exhibit 7.

It is important to stop at this point to verify that the cash-flow forecast shows positive balances in each required fund until project completion. If not, the community will have to locate additional resources.

PLANNING THE OPERATING BUDGET AND USER CHARGE SYSTEM

The basic techniques used to set up the project budget and cash-flow forecast will also be useful in structuring the operating budget for the completed facility. For communities upgrading or expanding an existing system, the rate increases or other sources of operating revenue needed to cover the additional **operating expenses** and added debt service costs can be considered during an annual review of the existing operating budget. For new systems, however, the operating budget for the wastewater treatment **enterprise fund** will have to be built from scratch. It is important that key elements of the first year's operating budget be completed in the pre-construction phase. With a good operating plan in hand, changes in the cost and design of the project that occur during construction can be monitored for their effect on budgeted revenues and expenses, with ample time to take corrective actions, if needed.

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TIP: *For existing systems, an increase in rates prior to starting construction can allow the community to develop capital reserves, which can, in turn, be used to reduce the amount of long-term borrowing. If construction of your project is expected to span several years, you should plan a series of rate increases so that new charges are phased in gradually.*

The first step in setting up an operating budget, estimating expenses, can be prepared from work completed earlier. The major expenses for the first year of operation can be estimated from: (1) the expected operation, maintenance, and replacement costs provided by your engineer (see Chapter II) and (2) the expected debt service for the bond issue estimated in the project budget. All other expense items (e.g., contractual services, administrative costs, interdepartmental service accounts, training, payments in lieu of taxes, etc.) should also be identified and included in the operating budget.

The second step consists of developing reliable sources of revenue that will match or exceed expected expenses. The revenue plan should be flexible enough to meet the requirements of users, local and State governments, bond holders, and EPA (if grant-funded), while ensuring self-sustaining operations of the completed facilities. Typically, the chief source of operating revenue will be from the collection of user fees. Other revenue sources in common use include property taxes, connection fees, inspection fees, system development charges, and dedication of special utility or sales taxes to the wastewater treatment fund.

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TIP: *Development of a revenue plan should begin at least one year prior to project start-up to ensure that a rate structure is in place before bonds are sold. Potential investors and bond rating agencies will be favorably impressed by this indication that the community has provided for an adequate revenue base.*

As a prerequisite to receiving an EPA grant, EPA regulations specify that you must develop a user charge system designed to produce adequate revenues to pay all costs of operation and maintenance (including replacement). Although the revenue plan must include collections for covering expected **capital outlays** and debt service of outstanding bonds and notes, EPA regulations do not require you to use any particular method or basis for assessing charges to recover the cost of capital items.

An EPA-approved system of user charges must provide that each user or user class pay its proportionate share of the operating costs, based on the quantity and quality of the wastes discharged to the sewer system. EPA regulations further provide that you establish an adequate financial management system that will accurately account for revenues and expenses, based on an annual operating budget. (See Chapter IV for further discussion on establishing accounting systems.) The regulations also require that you inform each user annually, in conjunction with a regular bill, of the rates established for the year and the portion that is attributable to operating expenses. You will have to adopt the user charge system through passage of an ordinance or other legislative enactment.

Exhibit 8

Summary of Cash Balances
Forecast of Ending Cash Balance

Month	Construction Fund	Note Red. Fund	Total
1	*$5,606,700*	*$ 0*	*$5,606,700*
2	*5,007,700*	*206,000*	*5,213,700*
3	*4,392,400*	*602,200*	*4,994,600*
4	*3,665,100*	*1,019,800*	*4,684,900*
5	*2,976,800*	*1,472,800*	*4,449,600*
6	*2,060,400*	*1,689,650*	*3,750,050*
7	*1,395,100*	*1,178,850*	*3,573,950*
8	*925,400*	*2,520,000*	*3,446,250*
9	*499,200*	*2,801,150*	*3,300,350*
10	*253,600*	*3,059,250*	*3,312,850*
11	*132,600*	*3,301,550*	*3,434,150*
12	*0*	*0*	*0*

In order to meet the EPA requirements for user charge systems and to develop a revenue plan, you will need to undertake a comprehensive rate study. The study should consist of the following steps:

- Establish a rate study team. This group should include representatives from the agency's management, operation, planning, and finance functions, as well as in-house or outside legal counsel. An engineering or financial consultant should be involved in the process along with in-house staff.
- Establish billing collection processes. In an agency that presently charges customers for water or sewer services, this step will be limited to ensuring that the existing process will handle the new user charge structure. In a new agency, or one with no experience with user charges, at least two additional months should be allowed to establish accounting records, print bills, and develop a collection system.
- Determine the annual costs of the system. The goal of this step is to determine how much revenue must be generated through charges. The costs are in two distinct areas. One is the annual cost of operating and maintaining the facility (e.g., salaries, chemicals, parts, and electricity). The second area is the cost of annual principal and interest on the borrowing for the treatment plant, as well as the costs related to any prior bonds or loans.
- Allocate the total amount of revenue to be raised from user charges for various user classes. This step requires an estimate of system loadings in terms of both flow and strength. From these estimates, unit charges can be developed and the charge to each user class established.

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***TIP:** Throughout the process of developing a revenue plan and user charge system, you should hold public hearings, establish advisory groups, seek out newspaper or television coverage and use other appropriate methods of public involvement to keep your community well-informed. Citizens who are convinced about the importance of adequately financing wastewater treatment can be a positive force in mitigating any adverse public reaction to rate increases.*

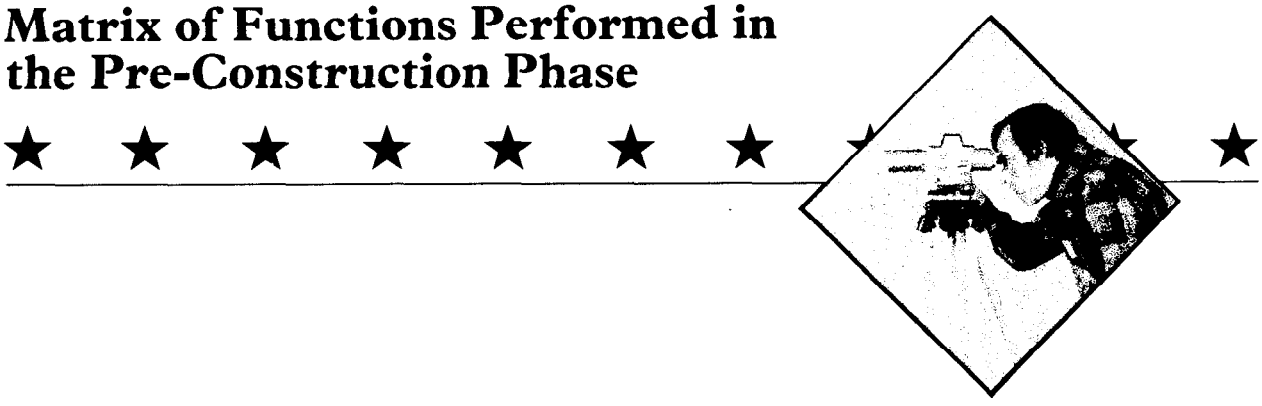
The user charge study may take a year or longer to complete, especially if new revenue collection systems must be incorporated. EPA regulations require that the user charge system be approved by EPA prior to grant award and enacted before the facilities are placed in operation. (See Chapter V for a description of this task.) A source of guidance on setting user charges is EPA's *User Charge Guidance Manual for Publicly-Owned Treatment Works.*

CONCLUSION

Exhibit 9 reviews the major financial activities in the pre-construction phase. With adequate short-term financing, a plan for long-term financing, a strong construction contract, a project budget and a cash-flow forecast, an operating budget, and a user charge system all in place, you are ready to proceed with building the facility itself. You have already laid the foundation with careful planning and have built a strong framework with the pre-construction financing steps. You have now moved into scoring position and have an excellent chance to score a run.

Exhibit 9

Matrix of Functions Performed in the Pre-Construction Phase



What is Done	*Who Does it*	*When*	*To and With Whom*
SHORT-TERM FINANCING	Finance Officer	While selecting a construction contractor	Bond Counsel Financial Advisor
DESIGNING BOND ISSUE	Finance Officer	When short-term financing proceeds are received	Bond Counsel Financial Advisor
CONSTRUCTION CONTRACT	Purchasing Agent	When project design is complete	Engineer Contractors
PROJECT BUDGET	Finance Officer	When construction contract is signed and short-term financing is complete	Financial Advisor
CASH-FLOW FORECAST	Finance Officer	When project budget is completed	Financial Advisor
PLANNING THE OPERATING BUDGET	User charge study team	Begin prior to initiation of construction finish prior to facility operation	Submit recommendation to legislative body
OVERALL PROJECT MANAGEMENT	Project Manager	Throughout the project	All team members involved in this phase

CHAPTER IV

Financial management during the construction phase: advancing to third

Your community is now ready to begin construction, having completed the important preliminary steps. Good financial management is just as important during construction as in the previous stages. If you allow financial control to slip now, you will be left stranded at second base at the end of the inning.

During construction, there are five major financial activities that make up the subparts of this chapter: establishing accounting systems, recording transactions, investing construction funds, managing the contract, and monitoring project progress. While most of these functions are ongoing, they are listed in the order of likely precedence.

ESTABLISHING ACCOUNTING SYSTEMS

Establishing and maintaining adequate accounting systems is important in any local government, but a community must be particularly careful to do so when managing a large construction project, due to the potential for loss of funds or a poor product.

The most important element of an accounting system is a set of controls. Financial controls exist for four important reasons. First, they assist in error detection and correction. Second, they help ensure that resources are conserved and used only for the construction process. Third, they help the community meet Federal and State requirements for careful stewardship of grant monies. Fourth, they play an important part in documenting the project for purposes of auditing.

A system of **internal controls** is based on premises that are simple, but often difficult to carry out, particularly in a small community. The premises are:

- responsibility for initiating, recording and reporting financial transactions should be centralized in one department in order to strengthen control over resources;
- accounting information should be contained in a unified record-keeping system that allows for easy access to information;
- consistent procedures and standards should govern all financial records and reporting;
- accounting duties should be assigned so that no one person is responsible for one transaction from beginning to end;
- operational employees should not have any accounting duties;

- important accounting documents should require the signature of a responsible financial official; and
- records should be regularly reconciled and corrected as necessary.

EPA regulations require that communities receiving Federal grants maintain adequate systems of financial control as a condition of grant receipt. Specific requirements include accurate, current and complete disclosure of all grant-related transactions; complete records; control over property and funds; comparison of budgets to actual results; and procedures to determine allowability of costs. In addition, the accounting system must be designed to provide adequate financial management of the facility once the project is complete.

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***TRAP:** The five most common accounting problems for communities receiving grants are:*

- *failure to separate eligible and ineligible costs;*
- *failure to segregate costs between different grants;*
- *failure to develop written procedures for grant accounting;*
- *failure to justify and record Federal reimbursements;*
- *failure to maintain documentation supporting payment requests.*

While it is beyond the scope of this handbook to prescribe a complete accounting system, it is possible to recommend some steps that a community may take to improve its ability to account for an EPA grant. Good grant accounting procedures include the following:

- The finance officer should establish a separate ledger account for the project in the community's books. Your accounting system probably already divides revenues and expenditures by fund, department, or other organizational division. The finance officer should determine how best to establish a set of accounts so that project transactions are recorded and reported separately from other transactions. This will allow your community to track revenue by source and expenditures by line item for the project.
- The finance officer should assign specific individuals to account for all project-related transactions. One person might be responsible for requesting EPA reimbursements, another for making payments to contractors, and so forth. You should also assign one person to sign all project-related forms, including checks, reimbursement requests and the like.
- The finance officer, in conjunction with the public works director, should develop written procedures for the project. Procedures should cover the following topics:

  - what documentation and approval are required before paying the contractor;
  - how retainage will be handled;
  - when requests to EPA for reimbursement will be made and by whom; and
  - what reports must be prepared and how often.

- The finance officer should develop forms and reports to account for grant activites, including comparisons between budget and actual performance, cash-flow tracking, authorization to make payments, etc.
- The finance officer should establish a system within the community's payroll structure to ensure that any staff time that is to be charged to the project is adequately documented. This generally requires a timesheet on which an employee breaks down his or her daily activity by hours spent on the project versus hours on other activities. For project-related activities, the employee should also state briefly what he or she did during the charged time. You should also set up a system to charge a pro-rated share of employee benefits and payroll taxes to the project. If work done by employees (often called "force account work") is expected to exceed $25,000, the State reviewing agency must approve it as a condition of receiving an EPA grant.
- The finance officer should make sure that everybody who will be working on accounting for the project understands *what costs are not eligible for EPA reimbursement,* then set up a separate sub-account in the project accounting system to record all ineligible costs.
- The finance officer should establish project files and make sure that all documents relating to the project are filed by document type and then chronologically within each type of document. This will be necessary if there are questions about reports generated when the EPA auditors arrive.
- The finance officer should establish an inventory of all property and equipment purchased as part of the project.

For additional information, refer to the EPA brochure entitled, "What to do Before and After the Auditors Arrive." There are a number of other steps you can take at the outset of a project to make it easier to account for and control the project. The finance officer should take responsibility for determining what steps are necessary, assisted by an outside auditor if necessary.

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***TRAP:** One common mistake made by communities with construction projects is using separate bank accounts to keep track of different types of money (e.g., grant funds vs. local funds, eligible vs. ineligible items, etc.). This should be avoided at all costs and done only when note or bond indentures require separate bank accounts to secure the debt obligations. Multiple accounts are expensive to maintain and to balance and they also promote accounting errors. You should develop an accounting system that ensures that money is tracked and credited to the right ledger account instead of opening new bank accounts.*

PROCESSING AND RECORDING TRANSACTIONS

With the accounting system in place and construction underway, the finance office will settle into a routine of accounting for the project along with its other duties. As financial events take place, the finance office will use the accounting system to ensure that all financial transactions are processed, recorded in the books and summarized in reports. This discussion will summarize the processing and recording functions by describing how some of the more common financial events should be handled.

When notes are sold:

The accounting system must account for the receipt of proceeds. First, the note indenture should be read carefully by the finance department so that proceeds are deposited properly. Then the proceeds should be placed in the appropriate bank account quickly; interest earnings for a day or two on a deposit of this size can be significant. The deposit should be recorded in the cash receipts journal, properly divided between the sub-accounts of eligible costs. The cash receipts entry should be backed up by the community's standard form for receipts, along with a copy of the note indenture and a statement from the underwriter of how the proceeds were calculated.

When employees charge time to the project:

Each employee working on the project, whether as construction laborer or construction manager, must enter project-related hours on a timesheet and turn it in at the time specified by payroll policies. The timesheet should be signed by the employee's immediate supervisor; the construction manager should also sign to verify time spent on the project. When paychecks are written, the total amount charged by all employees (both in direct labor and in benefits and payroll costs) should be entered in the payroll ledger for the project, once again split between eligible and ineligible items. All timesheets that charge time to the project should be filed chronologically along with calculations of benefits expenses, for review by EPA's auditors.

When the contractor requests partial payment:

You should develop a form that the contractor uses to request payment. When the request is received, it should be verified by both the engineer and the construction manager. The payment request should reflect the retainage allowed by the contract. You may wish to issue a check to the contractor as soon as payment is approved, since contractors frequently experience cash-flow difficulties. The check should be recorded in the check register in the project account, broken down into eligible and ineligible costs. You should also maintain a log that keeps a running balance on each construction contract, listing the original amount, additions due to change orders, subtractions due to payments, and the current balance.

When the community purchases equipment:

When an invoice arrives for equipment to be used in the project, the engineer and construction manager should both verify the necessity of the equipment, that it arrived, and that the invoice is correct. A check may then be written and recorded in the check register. You should also establish an inventory card for the equipment, listing its purchase price and date, location, equipment identification number, and expected useful life (for calculating **depreciation**). All inventory cards should be filed for audit. Once a year, the card should be used to conduct a physical inventory to see if all equipment is still in use.

When users pay connection fees:

It is not normally necessary to physically segregate connection fee payments from other monies. Instead, they must be recorded in the project account in the cash receipts journal on a separate revenue line. *Revenue and expenditure sub-accounts in the project accounting records should match those in the project budget for easy budget control.* Receipts should be issued for all fee payments and, if connections are mandatory, you should maintain a list of all customers who must pay fees, to be marked "paid" when money is received. You should also be able to determine that connection fees are used for proper purposes. For example, if connection fees are limited to building one sewer line, you must be able to show that you spent at least as much on that line as you received in connection fees.

When the community invests excess construction funds (coming from its own sources--not federal sources):

Investments should be made only after soliciting quotes by telephone from more than one bank or institution. You should invest with the institution that pays the highest rates and provides a completely secure investment. A record should be kept of the rate quoted by each institution. An entry should be made in bank account records to reflect movement of cash from the checking account to an investment instrument. When the investment matures, the payment of interest must be verified against the quoted rate. An entry should be made to return the principal and interest to the checking account. The interest should be recorded as revenue in the cash receipts journal.

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TIP: Note indentures and good financial management practices both require that interest be credited to the account from which the principal was drawn. If an investment is made from funds restricted to repayment of notes, the interest revenues should also be credited to that account.

When the community requests reimbursement from EPA:

It is in your best interest for cash-flow purposes to request payment from EPA on a monthly basis for costs actually incurred. An employee, perhaps the construction manager, should be assigned the responsibility of initiating this process at the same time every month. The first step is to determine total costs during the month that are eligible for reimbursement. The best way to accomplish this is to record in the eligible costs sub-account in the check register all those incurred costs that have already been paid by EPA. It is then a relatively simple matter of requesting reimbursement for those incurred costs that are not marked as paid. These should be totalled and EPA's standard form for reimbursement (EPA Form 271) filled out and signed by either the finance officer or the chief administrative officer.

Copies should be filed and sent to the construction manager. Once the reimbursement is received, it should be entered in the cash receipts journal and all reimbursed expenditures so marked in the check register. You must also maintain a log of reimbursement requests, listing the date and amount of each request, as well as the date the reimbursement is received.

To summarize, project transactions should be recorded just as any community with a good accounting system records all transactions. As long as you maintain a complete set of accounting records (general ledger, cash receipts journal, check register, payroll system, chart of accounts and so on), make sure that all project-related events are recorded in the proper accounts separate from all other activities, maintain records on the **accrual basis of accounting,** and regularly generate and review reports, you should not have any great difficulty with project accounting.

INVESTING CONSTRUCTION FUNDS

Note proceeds should be invested by the finance officer in a manner that: (1) recognizes the need to meet expenses identified by the construction draw-down schedule; (2) provides a good (current market) return on the investment; and (3) ensures preservation of the principal amount invested. A conservative approach to the funding demands identified in the draw-down schedule is needed to permit earlier disbursements to cover unanticipated expenses or to pay contractors if construction is running ahead of schedule.

Speculative investments, which place the principal amount at some risk, have no place in municipal finance generally and are particularly inappropriate when it comes to investment of borrowed funds. The challenge facing the issuing government is to identify a strategy that both protects the principal of the borrowed funds and offers a fair market return on investment. Remember that your goal is to build a wastewater treatment facility, not to chase every last dollar of interest earnings.

A variety of investment alternatives are available that satisfy the needs identified above. The section below provides a comparison of some of the most common investment alternatives and indicates the advantages and disadvantages of each. State statutes and local charter provisions vary concerning authorized use of note proceeds, so consultation with bond counsel is important before any investment decisions are made.

U.S. Treasury Securities:

Backed by the **full faith and credit** of the United States government, these securities represent the most secure investment option for communities. Treasury bills are available in maturities of up to one year; notes, in maturities of up to 7 years; and bonds, in maturities of up to 30 years. Because Treasuries are secured by the absolute pledge of payment by the U.S. government, these investments carry lower interest yields than many other securities. A loss is possible if you are forced to sell Treasury investments prior to the stated maturity date.

In general, you should avoid investments that may have to be sold prior to maturity.

U.S. Government Agency Issues:

A variety of U.S. government agency issues are available that have characteristics similar to Treasury securities. The **yield** on agency issues is generally higher than on Treasury securities because they are not backed by the full faith and credit of the U.S. government. Again, the potential for market loss is possible if these securities are sold prior to maturity. The market for agency issues is occasionally volatile and unpredictable.

Certificates of Deposit:

Certificates of Deposit, or CDs, are receipts that represent a deposit of funds at a commercial bank or savings institution. The CD specifies a maturity date and interest rate to be paid. Security is provided by the quality and extent of **collateralization**, which is the cash and securities that the institution pledges as security against the community's investment. Uncollateralized CDs are secured by the creditworthiness of the depository institution. (Most States require that CDs be collateralized.) As with Treasury securities, a market loss may result if sold prior to maturity.

Repurchase Agreements:

A repurchase agreement is an agreement between a community and a bank wherein the community buys a security from the bank at a specified price and the bank simultaneously agrees to repurchase the security at a future date and price. Since security of a government's investments is a dominant consideration, all investments in repurchase agreements should be conducted in such a way that: (1) the community takes physical custody of the instrument; and (2) the investment be more than 100% collateralized to guarantee the security of the principal invested. The difference between the price the community pays for the security and the price it receives for re-sale of the security to the bank represents its return on investment. Security is provided by the creditworthiness of the bank in the transaction. Repurchase agreements offer the advantage of considerable flexibility, but you should require a contract that protects your interests (as indicated above) in the event of interest rate fluctuations.

Savings and Checking Accounts:

Communities may open bank accounts with note proceeds in much the same way individuals handle their own funds. This option provides maximum **liquidity** (ability to convert the investment to cash) and is insured up to the limits of the Federal Deposit Insurance Corporation (FDIC). The Federal Savings and Loan Insurance Corporation (FSLIC), a division of the Federal Home Loan Bank Board, provides insurance for deposits made in Federal Savings and Loans Banks. The interest yield is typically lower than what is available from other investment alternatives. Where possible, you should write checks on an insured, interest-bearing checking account such as a "NOW" account, so that all construction funds earn some interest.

Pooled Investment Programs:

Many counties and States have pooled investment programs that offer communities immediate liquidity and a better interest yield than is available from savings or checking accounts. The security provisions of local government investment pools (LGIPs) vary considerably. Most LGIPs invest in U.S. government securities, CDs, and repurchase agreements. The finance officer is advised to exercise caution in the choice of this investment alternative for the investment of construction funds.

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TIP: In a falling interest rate environment, the interest yields in an investment pool are generally higher than those available through independent investing. This is because the interest yield in the pool is determined in part by securities that were purchased when rates were high.

MANAGING THE CONTRACT

Having developed a complete construction contract in the pre-construction phase, you must devote your efforts during the construction phase to making sure that the contract is followed. Three essential techniques available to assist in this process are appointing a construction manager, establishing strong reporting requirements for the engineer, and maintaining control over change orders.

The construction manager and project manager should be employees of the community. For smaller jurisdictions which do not already employ individuals with a range of construction and engineering experience, the construction manager will probably be a contract employee whose relationship with the community will cease with the formal acceptance of the construction work. Whatever the case, the employee who does this job must be allowed to devote enough time to do it properly. A major construction project may require at least one-half, if not all, of the construction manager's working time.

Ideally, the construction manager should have a good understanding of both construction techniques in general and of wastewater treatment systems in particular. If the community currently has an operating treatment system, a plant manager or public works director would be the ideal choice for this job.

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***TIP:** If your treatment system employees are unionized and a supervisor has negotiating experience, appoint that person as the construction manager; the talents required are strikingly similar.*

You must give the construction manager explicit authority to represent your community in all dealings with the prime contractor and the engineer; a formal action by the legislative body is a good idea. If the manager does a good job, he or she will occasionally ruffle the feathers of both the engineer and the contractor, who may be tempted to find a more sympathetic ear elsewhere on the staff. The governing body should state when appointing the manager that all communication between the community and the contractor is to be through the manager and that all employees should follow this rule. It will help ensure that the contractor does not receive conflicting instructions.

The construction manager's task is to monitor progress toward completion. This person must therefore be familiar with the facility design, the construction contract, and the schedule, as well as EPA regulations that govern construction. The manager should meet regularly (at least every two weeks) with the engineer to discuss progress and problems and should regularly inspect the work and keep in touch with the contractor. It is a temptation to leave this responsibility to the engineer, but remember that the community, not the engineer, has to live with the final product and pay debt service and all operation costs.

When either the engineer or contractor submits requests for partial payment, the construction manager should review and approve them before they are paid. The same procedure applies to recommendations from the engineer that the community buy a piece of equipment for the project. The manager should also review and approve any community employees' timesheets that show they worked on the project. Any recommendations for change orders received from the engineer should be routed through the construction manager for his or her recommendation before they are approved by the legislative body.

The construction manager should approve the quantities and progress on the contract for payment but should not be involved directly in the payment to the contractor because this would violate an important rule of internal controls, as described later in this section. Second, the manager should be required to make progress reports to the community's appointed and elected officials. As a general rule, the manager should be expected to report routinely to the chief administrative officer and to the legislative body on a monthly basis.

Good reporting from the engineer is the second tool available to the community to ensure successful construction. The engineer should regularly inspect the construction site and keep apprised of developments to the greatest extent possible. The engineer should also report by telephone or in person to the construction manager at least weekly. The engineer should prepare a written report on the project at least monthly. That report should summarize all progress to date, especially that accomplished in the past month. The engineer should also report on what is expected to be accomplished in the next month, with particular attention to any possible problems or potential requests for change orders. The report should also provide an update on progress as measured against the original construction schedule.

For each event on the schedule that is completed, the actual completion date should be entered next to the scheduled date. For future events, the engineer should report on any items that are not expected to be completed on schedule, giving a reason and a new estimate of the completion date. The engineer's report should be forwarded to the construction manager for written comment and then reviewed by the chief administrative official and the legislative body.

As mentioned in Chapter III, some change orders may be necessary during construction. This could occur when a specified component is not available in a reasonable time frame, or when bedrock is uncovered in digging the foundation for the new trickling filter (although you should still ask the engineer why the specifications required an unprocurable part and why a soil sample didn't show the bedrock). Other change orders may be necessary, and may represent a chance to save money or make an improvement to the original design. You must carefully consider all change orders, particularly those which represent increased costs.

The key element in deciding if a change order is needed is whether a significant change in conditions has occurred (and could not have been reasonably

anticipated by an experienced engineer and contractor). If so, you should accept the change order and carefully negotiate a price; change orders can be used by contractors to increase their profit margin. All change orders should be justified in writing by the contractor, approved by the engineer and construction manager, and formally approved by the legislative body. If your community receives an EPA grant, some change orders may require State or EPA approval. EPA provides detailed information on change orders in its publication *Management of Construction Change Orders: A Guide for Grantees.*

MONITORING PROJECT PROGRESS

The finance officer should generate a complete set of project financial reports on a monthly basis. The goal should be to have all reports completed by the tenth day of the following month. The reports should include:

- a project **balance sheet**;
- a report of contract status;
- a report of reimbursement status;
- a report of budgeted and actual sources and uses; and
- a report of forecast and actual cash balances.

The balance sheet compares the assets and liabilities of the project accounts. Assets are things of value that belong to the project, typically cash and investments, grants receivable, and the value of construction in progress. Liabilities are amounts owed by the project, including repayment of notes, payroll, invoices payable, and so forth. The balance sheet simply compares assets and liabilities and tells whether the project is solvent.

The report of contract status should simply summarize financial transactions (change orders, payments, etc.) regarding the construction contract for the previous month along with a summary of all previous contract payments and the balance remaining on the contract.

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***TIP:** It is a good idea to compare this report with the engineer's monthly progress report to determine if payments are closely related to actual progress. If not, future requests for payment should be more carefully reviewed.*

The report of reimbursement status shows all grant reimbursement activities for the previous month and should show for the entire project the total of eligible work completed, grant reimbursements requested, and grant reimbursements received. It may also be useful for cash-flow planning purposes to calculate the average delay from request to receipt of reimbursement. If reimbursements are behind schedule, you must learn the cause of the delay and address the problem. Check the activities of your staff in completing and submitting the forms to EPA. Only after you have established that your requests have been timely and accurate should you seek information from EPA on the status of your reimbursements.

The report of budget and actual sources and uses is of critical importance to good project management. It indicates whether the project is headed for trouble before it is completed. Exhibit 10 is a sample budget report based on the budget shown in Chapter III. It is useful to point out that while the "project-to-date actual" ($6,797,075 in the fourth column) is below the project-to-date forecast ($7,241,800 in the next column) by approximately $450,000, the corresponding uses of funds "actual" is below the forecast by approximately $900,000. Thus, the situation is under control for the moment, but vigilence must never cease.

If the project-to-date actual expenditures are greater than the forecast expenditures, you must take immediate action to identify and remedy the problem. Regular monitoring of these figures should identify areas of concern before the excess expenditures become serious cash-flow problems. Options to remedy this situation are described below.

Note that Exhibit 10 uses the same categories of sources and uses as the budget and is laid out in the same basic format. It shows the original budget for each item, the amount received or spent in the current month, the amount received or spent for the project to date, and the amount still to be received or spent. When the community has done a monthly cash-flow forecast, it can also include a comparison of the amount actually received or spent through the report date to the amount that was expected to be received or spent. This gives a better picture of the budget status than the rest of the budget report because it recognizes that many sources and uses do not flow uniformly throughout the project.

The legislative body and the chief administrative official should expect some explanation of the budget report, covering the major variances between budget and actual, the reasons for the variances, and the anticipated impact of each. The chief financial official should prepare this report, usually after discussing each item with the construction manager. The project manager should also recommend any changes that will be necessary to finish the project within budget or, if this is impossible, he should ask the finance officer to locate additional resources.

Exhibit 10

Budget Report
As of End of Month 4: Total Project

Sources	Budget	Month Four Actual	Project-to-Date Actual	Project-to-Date Forecast	Forecast vs. Actual Favorable/ (Unfavorable)	Remaining Balance	Percent Remaining to be Received
Permanent Financing							
EPA Grant	$ 3,500,000	$312,455	$ 543,000	$1,014,000	($471,000)	$ 2,486,000	71.03%
State Grant	338,500	61,000	91,000	75,000	(16,000)	263,500	77.84
Capital Reserves	150,000	0	150,000	150,000	0	0	0.00
Interest Earnings	367,300	28,067	106,209	124,800	18,591	242,500	66.02
Bonds	2,593,000	0	0	0	0	2,593,000	100.00
Total Perm. Financing	$ 6,948,800	$401,522	$ 890,209	$1,363,800	($468,409)	$ 5,585,000	80.37%
Proceeds from Notes							
Grant Antic. Notes	$ 3,500,000	$ 0	$3,527,000	$3,500,000	$ 27,000	$ 0	0.00%
Bond Antic. Notes	2,378,000	0	2,379,866	2,378,000	1,866	0	0.00
Total Proceeds	$ 5,878,000	$ 0	$5,906,866	$5,878,000	$ 28,866	$ 0	0.00%
Total Sources	**$12,826,800**	**$401,522**	**$6,797,075**	**$7,241,800**	**($439,543)**	**$ 5,585,000**	**43.54%**

Uses	Budget	Month Four Actual	Project-to-Date Actual	Project-to-Date Forecast	Forecast vs. Actual Favorable/ (Unfavorable)	Remaining Balance	Percent Remaining to be Received
Permanent Outlays							
Engineering	$ 457,300	$ 41,320	$ 268,000	$ 235,000	($ 33,000)	$ 222,300	48.61%
Construction	5,480,100	235,690	1,356,799	2,095,000	738,201	3,385,100	61.77
Project Mgt.: In-house	27,000	2,346	9,105	8,600	(505)	18,400	68.15
Short Term Interest	369,700	0	0	0	0	369,700	100.00
Issuance Costs—Notes	15,300	0	12,466	15,300	2,834	0	0.00
Issuance Costs—Bonds	38,200	0	0	0	0	38,200	100.00
Contingency	561,200	0	0	203,000	203,000	358,200	63.83
Total Permanent Outlays	$ 6,948,800	$279,356	$1,646,370	$2,556,900	$910,530	$ 4,391,900	63.20%
Repayment of Notes							
Bond Antic. Notes	$ 2,378,000	$ 0	$ 0	$ 0	$ 0	$ 2,378,000	100.00%
Grant Antic. Notes	3,500,000	0	0	0	0	3,500,000	100.00
Total Repayments	$ 5,878,000	$ 0	$ 0	$ 0	$ 0	$ 5,878,000	100.00%
Total Uses	**$12,826,800**	**$279,356**	**$1,646,370**	**$2,556,900**	**$910,530**	**$10,269,900**	**80.07%**

Exhibit 11

Cash-Flow Report
End of Month 4

Construction Fund

Month	Forecast Ending Balance	Actual Ending Balance	Over (Under) Forecast
1	*$5,606,700*	*$5,547,098*	*($ 59,602)*
2	*5,007,700*	*5,436,791*	*429,091*
3	*4,392,400*	*5,343,670*	*951,270*
4	*$3,665,100*	*$4,605,598*	*$940,498*

Note Redemption Fund

Month	Forecast Ending Balance	Actual Ending Balance	Over (Under) Forecast
1	*$ 0*	*$ 0*	*$ 0*
2	*206,000*	*0*	*(206,000)*
3	*602,200*	*0*	*(341,000)*
4	*$1,019,800*	*$ 545,107*	*($474,693)*

Exhibit 11 is a sample of a cash-flow report. Note that, once again, this report is based on the original cash-flow forecast, using the same format. This report should simply state the originally forecast cash balance at the end of each month and compare it to the actual balance for the same month. When this comparison is completed, the finance officer should review it carefully for significant differences between the forecast and actual figures. If actual cash balances are higher than forecast, you may wish to invest a large share of the construction funds, bearing in mind the need to leave a continuous margin for unexpected outlays. If balances are lower than forecast, closer scrutiny is needed. The finance officer must determine if the forecast was incorrect or if the lower balances are an indication of future cash-flow problems. If the balances are lower, you may have to take one of the following corrective steps:

- seek other revenue;
- reduce the scope of the project to meet available revenue; or
- if total revenues are still expected to meet or exceed total expenditures, but there is a timing problem, either (1) borrow the difference needed to assure a positive cash balance throughout the project, or (2) restructure construction to delay some expenditures until revenues are available. Costs of the delay, however, are not allowable costs under the EPA grant program.

While a project budget is generally permanent, remaining the same throughout the life of the project, the cash-flow forecast must be updated regularly throughout the process.

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***TIP:** It is a good practice to develop an updated cash-flow forecast every month, after reviewing the cash balance report. This new forecast should reflect the actual cash-flow up to the date of the forecast, with a revised monthly forecast of all sources and uses for the remainder of the project.*

The approach recommended in the tip above allows you to keep a continuous eye on the cash position, adjusting both forecasts and operations to changing conditions. Like the budget report, the cash-flow report should include some interpretation by the chief finance officer and should be circulated to the construction manager, the chief administrative officer, and the legislative body.

CONCLUSION

Exhibit 12 reviews the steps entailed in managing finances during the construction phase. Financial management during the construction phase is basically a matter of putting the systems developed earlier in the process to work. It is also a matter of investing construction funds wisely to secure the maximum interest earnings without ever risking the funds. If you invest carefully, manage your contracts, establish an adequate accounting system, account for all transactions, maintain adequate cash balances and stay within your budget, you will be virtually certain of sucessfully completing construction. You will be standing on third base, with the bulk of the work completed, but still needing one more hit to score a run. If you fail to manage your finances properly, the result could be extremely costly, possibly causing a stoppage of work on the project.

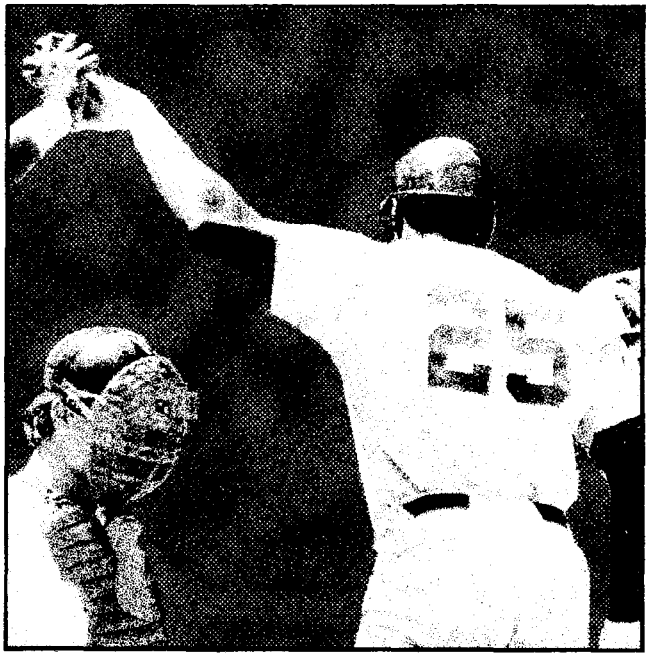
Exhibit 12

Matrix of Functions Performed in the Construction Phase

What is Done	*Who Does it*	*When*	*To and With Whom*
ESTABLISHING ACCOUNTING SYSTEMS	Finance Officer	Once	Internal staff
RECORDING TRANSACTIONS	Finance Officer	Daily	Internal staff
INVESTING CONSTRUCTION FUNDS	Finance Officer or Treasurer	At least once a year	With banks and brokers
MANAGING THE CONTRACT	Purchasing Agent, Construction Manager, Chief Executive	Daily	With the Prime Contractor and the Engineer
MONITORING PROJECT PROGRESS	Community Finance Officer	At least monthly	To Chief Executive and Governing Body
OVERALL PROJECT MANAGEMENT	Project Manager	Throughout the project	All team members involved in this phase

CHAPTER V

The project completion phase: crossing the plate



Once construction is underway, you must make final plans for the financial actions that will be necessary to finance and operate the facility and to complete the grants process. For EPA-funded construction projects, there are three major actions to be completed once the construction costs are known:

- implementing the user charge system and rates;
- selling the bond issue; and
- preparing for EPA's audit of the project.

If your community has followed the steps listed in the three previous chapters, the tasks described in this chapter will simply be the logical conclusion to processes that are already well underway. In the pre-construction process, for instance, you began development of a revenue plan and an adequate user charge system. Now you must adopt and implement the new rate structure. You also determined the type of bond issue and are now ready to sell the bonds. During construction, you established and maintained project records and reports. Now you should prepare them for the EPA grant audit.

IMPLEMENTING THE REVENUE PLAN AND USER CHARGE SYSTEM

Before beginning construction, you also completed development of a revenue plan, including the system of new user charges. (The study process is described in Chapter III.) Since the purpose of user charges is to provide enough revenue to operate and maintain the new treatment facility, you must now take the actions necessary to enact the rates before finishing the project. If your community receives an EPA grant, Federal regulations require that an approved user charge system be enacted before the facility begins operating.

Your governing body should take the final action by adopting an ordinance implementing the rates. This process should involve public notification and citizen participation in the rate-setting process. An ordinance should specify the rates (distinguishing between user charges and debt service charges), collection method, penalties for late payment, and other administrative features. Once the ordinance is adopted, all customers should be given advance notice of the new rates. You should also establish a system to review and update rates annually, so that user charge revenue keeps up with increases in costs. This review can best be done in the process of developing and adopting the annual operating budget for wastewater treatment.

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***TIP:** Long-term self-sufficiency of the treatment plant can be ensured by writing the rate ordinance so that any required rate increases are automatically built into the operating budget approval process.*

SELLING BONDS

Issuing bonds is a complex process that involves many players and legal restrictions. This area may be new to many small jurisdictions. It is important to allow enough time to complete the process and to carefully plan and manage each step in order to assure that long-term financing is secured in a reasonable time frame.

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***TIP:** Since the time needed to complete a bond sale varies with the type and complexity of the sale, the length of time needed should be determined well in advance of the need to sell the bonds. You should time the bond sale so that proceeds are available to pay off any short-term financing and any costs of construction that will not be paid from cash or short-term financing.*

The process for issuing bonds varies widely depending on State laws and on the characteristics of the particular bond issue. You must determine the type of long-term financing (general obligation or revenue) very early in the process before notes are sold to provide for interim financing. As a rule of thumb, you should begin preparing for the bond issue (as described below) no less than three months before the desired closing date (assuming that a bond election, if required, took place prior to construction). You must work closely with bond counsel and the financial advisor to set a realistic bond sale schedule.

Issuing bonds consists of three major phases: design, marketing, and closing. As indicated in Chapter III, the selection and design of the permanent financing arrangement must occur prior to the issuance of short-term debt to fund construction. BANs are secured by the ability of the community to sell its long-term debt. All steps necessary to allow the community to issue its long-term debt, whether it be general obligation or revenue debt, must be completed before BANs are issued. The decision on the form that the permanent financing will take, therefore, is made very early in the planning process. The actual marketing, sale, and closing of the long-term financing are accomplished in the project completion phase. These processes are described below.

Marketing the Issue

Once the structure of the issue is decided, you must begin the marketing process. The first task is to prepare the following necessary bond sale documents:

- An official statement. It presents the terms by which the bonds are to be offered, as well as financial and economic information on the issuing agency and the community as a whole. It is crucial that the financial advisor coordinate the preparation and distribution of the official statement to ensure its completeness and accuracy.
- A notice of sale. Prepared by bond counsel, this notice is published as required by State or local law. It summarizes the structure of the issue and the terms of the sale.
- An official bid form. Prepared by the financial advisor and bond counsel, it is used to present the bids. This form serves as the preliminary agreement between the issuer and the underwriter who purchases the bonds.
- An indenture (see the discussion of the design phase in Chapter III). This will be prepared by bond counsel and the financial advisor. As when short-term financing is chosen, the issuer's finance officer and attorney should carefully review the agreement to ensure understanding of its relationship to future system operation.

The second task is to obtain a bond rating on the proposed issue. Bonds may be sold without a rating, but investors sometimes expect higher interest rates in exchange for the lack of an independent appraisal of the creditworthiness of the issue. A small issue that will be sold mainly to local investors, however, does not usually need to be rated.

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***TIP:** The financial advisor should solicit input from potential underwriters to determine the need for a rating on small issues. If you have outstanding debt that has been rated, all subsequent issues with the same security should also be rated. Failure to request a rating of a new issue with the same security provisions as currently rated debt could result in the withdrawal of the existing rating.*

Bond issues can be rated for a fee by one of the major rating agencies located in New York City. The rating is then periodically reviewed until the bond is paid off. A rating expresses the quality of a bond and its credit risk. The four principal factors evaluated to rate a general obligation bond are the issuer's current and planned debt burden, financial strength, administrative abilities, and the community's economic condition. For revenue

bonds, the revenue-producing potential of the project is of primary importance. The financial advisor will normally assist in securing a rating. It is extremely important that all information requested by the rating agency be submitted well before the sale. The rating will normally be assigned and released to the investment community several days before the sale.

If the issue is to be competitively sold, a third task in marketing is to advertise the bonds for prospective investors. Advertisements should be placed in nationally recognized sources of information on the municipal bond market, such as *The Bond Buyer,* and in local newspapers. Official statements should be sent to banks and underwriters identified by the financial advisor and to any other potential purchasers who express interest.

Closing the Sale
The issue is completed with the following steps:

- Award the bids. The award is made in conjunction with bond counsel and financial advisor after all bids have been received, verified, and tabulated. The formal award is usually made by the governing body.
- Print the bonds. Bonds are usually printed by financial printers. Timing the printing of the bonds to be completed shortly after the sale of the bonds is important because the paying agent and registrar must have several days to prepare the bonds for delivery at closing.
- Close the bond issue. At closing, the financial advisor will verify final closing figures (the amount the purchaser owes the municipality). Closing documents prepared by bond counsel and the issuer are provided as a formal record of the transaction to the paying agent/registrar and the underwriter.
- Establish payment mechanisms. The paying agent/registrar will formally adopt systems for making interest and principal payments and for transferring bonds between owners. The issuer should also establish a schedule of payments to assist in cash-flow planning throughout the life of the bonds.

PREPARING FOR THE GRANT AUDIT

All construction projects that are funded by EPA grants may be subject to an audit by the Agency's Office of the Inspector General before the grant is formally closed. For additional information, refer to the EPA brochure entitled, "What to Do Before and After the Auditors Arrive." The purpose of the audit is to verify that all expenditures to be reimbursed by the grant are properly authorized, documented, and eligible for grant funding.

You and your contractor must maintain complete and orderly records. When you are notified that an audit will take place, staff should assemble the following records that will be needed by the auditor:

- grant applications, agreements, amendments, and contracts;
- accounting records that document receipt and disbursement of funds, payroll expenses, travel, payments to contractors, purchases of equipment and supplies related to the project, and documentation of in-kind (non-cash) payments;
- project bank account statements and cancelled checks;
- copies of all reports required under the grant (e.g., progress reports, facility plans, user fees, and industrial cost recovery reports);
- copies of financial status reports (budgets, budget reports, cash-flow reports, etc.) and copies of outlay reports and requests for reimbursement;
- copies of plans, specifications, change orders, and "as-built" drawings;
- copies of public notices of property acquisition and relocation actions; and
- Copies of audits conducted under OMB Circular A-128. (EPA auditors will build on the work of the A-128 audit to the extent possible.)

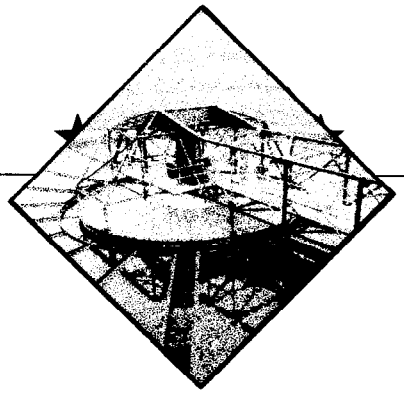
An audit will be a less difficult process if you have developed a logical system for retaining records. Auditors will work with your staff to discuss the scope of the audit and will also discuss the findings of the audit before a final report is issued. You will be given an opportunity to respond to all audit findings and exceptions.

CONCLUSION: SAFE AT HOME

Exhibit 13 shows the efforts required of your community to complete the project. The common element in the three processes covered in this section is the need to plan ahead for completing the project. The community that "gets a jump" on this process is likely to have its new charges adopted well in advance of their implementation, complete the bond sale successfully, and have no trouble with the audit. You will have reached home plate because you looked ahead to the next base, planned your route, and minimized the risk of getting tagged out.

Exhibit 13

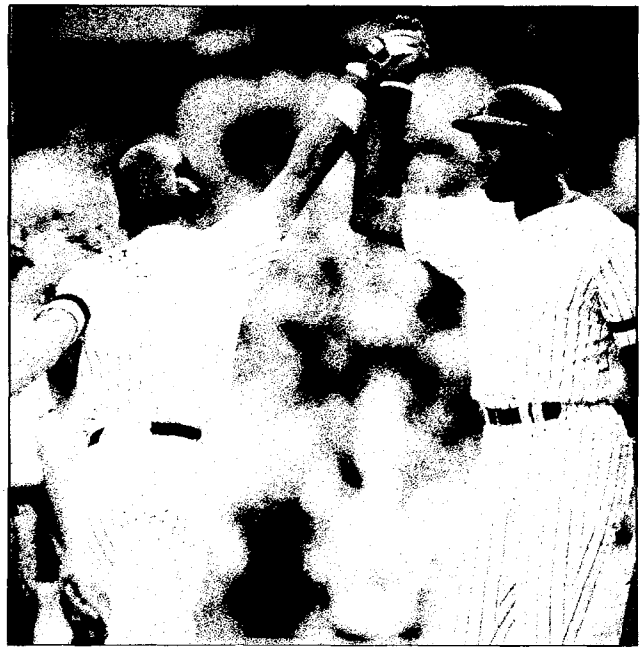
Matrix of Functions Performed in the Project Completion Phase



What is Done	*Who Does it*	*When*	*To and With Whom*
IMPLEMENTING USER CHARGES	Attorney	Before facility is operational	Chief Administrator Legislative Body
SELLING BONDS	Finance Officer	Before short-term financing matures	Bond Counsel Financial Advisor
PREPARING FOR AUDIT	Finance Officer	When all receipts have been collected and all disbursements have been made	Finance Staff Purchasing Agent
MANAGING THE PROJECT	Project Manager	Throughout the project	All team members involved in this phase

CHAPTER VI

Conclusion: the post-game wrap-up



By following the handbook's approach to financial management, you can score a run by successfully completing your wastewater treatment facility. The feat is made possible by an approach to the problem that realizes the necessity of rounding the diamond just one base at a time. You reach first base with a comprehensive capital plan, a well-rounded team of employees and consultants and a well thought out project design. You proceed to second with sound interim financing, a good construction contract, and careful budgeting and cash-flow planning. Once on second, you advance to third by building the facility, backing up construction with conservative investment practices, strong contract management, well-documented accounting, and regular financial reporting. The circuit is completed by setting user charges, arranging permanent financing, and preparing records for the grant audit.

The importance of this incremental, one-base-at-a-time approach cannot be emphasized strongly enough. You simply cannot expect to build a facility successfully without laying out the groundwork in the previous phases. Examples of the foolishness of any other approach abound. You may put yourself in a real bind if you cannot sell bonds because you failed to understand the legal restrictions on bonding early in the process; you cannot arrange correct interim financing without understanding the total budget, the cash-flow patterns, and arbitrage restrictions; you cannot use the construction contract to force adequate performance if you did not develop a sound contract in the first place. All of these problems can and do happen in facility construction projects where the community fails to manage the project properly. You can be sure to avoid them by carefully following the steps, in the right order, as recommended in this handbook.

As noted in Chapter I, this handbook cannot cover every detail of managing finances during construction. Appendix A contains a glossary of terms that are common in project financing, and Appendix B contains a bibliography of additional reference materials. While the handbook provides a good introduction and overview of the process, you will need to refer frequently to the EPA regulations as well as to more detailed materials in order to ensure success. By using these sources, and by carefully planning, controlling, and managing the process, you will ensure that your community gets its new treatment facility with no financial problems.

Appendix A: Glossary

Accounting System

The total set of records and procedures which are used to record, classify, and report information on the financial status and operation of an entity. (p. 6)

Accrual Basis of Accounting

The method of accounting under which revenues are recorded when they are earned (whether or not cash is received at that time) and expenses are recorded when goods and services are received or incurred (whether cash disbursements are made at that time or not). (See also "Modified Accrual Basis of Accounting" and "Cash Basis of Accounting.") (p. 42)

Appropriation

An authorization made by the legislative body of a government which permits officials to incur obligations against and to make expenditures of governmental resources. Appropriations are usually made for fixed amounts and are typically granted for a one-year period. (p. 7)

Arbitrage

Borrowing money in the tax-exempt market (through issuing notes or bonds) and then reinvesting that money at higher, taxable interest rates. (p. 22)

Audit

A systematic examination of resource utilization concluding in a written report. It is a test of management's internal accounting controls and is intended to:

- ascertain whether financial statements fairly present the financial position of the community and results of operations;
- test whether transactions have been legally performed;
- identify areas for possible improvements in accounting practices and procedures;
- ascertain whether transactions have been recorded accurately and consistently; and
- ascertain how faithfully officials performed their responsibilites. (p. 7)

Balance Sheet

A statement purporting to present the financial position of an entity by disclosing the value of its assets, liabilities, and equities as of a specified date. (p. 45)

Bond

A written promise to pay (debt) a specified sum of money (called principal or face value) at a specified future date (called the maturity date) along with periodic interest paid at a specified percentage of the principal (interest rate). Bonds are typically used for long-term debt. (p. 6)

Bond Anticipation Notes

Short-term interest bearing notes issued in anticipation of bonds to be issued at a later date. The notes are retired from proceeds of the bond issue to which they are related. (p. 22)

Bond Indentures

A legal document that spells out the obligations of a community in connection with the issuance of debt. (p. 26)

Glossary

Budget (Capital)

A plan of proposed capital expenditures and the means of financing them. The capital budget is usually enacted as part of the complete annual budget which includes both operating and capital outlays. The capital budget should be based on a capital improvement program. (p. 7)

Budget (Operating)

Plans of current expenditures and the proposed means of financing them. The annual operating budget (or, in the case of some State governments, the biennial operating budget) is the primary means by which most of the financing acquisition, spending, and service delivery activities of a government are controlled. The use of annual operating budgets is usually required by law. Even where not required by law, however, annual operating budgets are essential to sound financial management and should be adopted by every government. (p. 10)

Capital Assets

Assets of significant value and having a useful life of several years. Capital assets are also called fixed assets. (p. 8)

Capital Improvement Program

A plan for capital expenditures to be incurred each year over a fixed period of several future years setting forth each capital project, identifying the expected beginning and ending date for each project, the amount to be expended in each year, and the method of financing those expenditures. (p. 6)

Capital Outlays

Expenditures which result in the acquisition of, or addition to, fixed assets. (p. 34)

Capital Projects

Projects which purchase or construct capital assets. Typically, a capital project encompasses a purchase of land and the construction of a building or facility. (p. 5)

Cash Basis of Accounting

A basis of accounting under which transactions are recognized only when cash changes hands. (See also "Accrual Basis of Accounting" and "Modified Accrual Basis of Accounting.")

Cash-Flow Forecast

A projection of the cash receipts and disbursements anticipated during a given time period. Typically, this projection covers a year and is broken down into separate projections for each month, week, and day during the year.

Certificate of Deposit

A negotiable or non-negotiable receipt for monies deposited in a bank or other financial institution for a specified period at a specified rate of interest. (p. 43)

Collateralization

The process of providing additional security for an investment by setting aside other securities that will be available to the investor in the event of a loss on the original investment. (p. 43)

Glossary

Cost Accounting

The method of accounting which provides for assembling and recording all the elements of cost incurred to accomplish a purpose, to carry on an activity or operation, or to complete a unit of work or a specific job.

Debt

An obligation resulting from the borrowing of money or from the purchase of goods and services. Debts of governments include bonds, time warrants, and floating debt. (p. 6)

Debt Limit

The maximum amount of gross or net debt which is legally permitted. (p. 7)

Debt Service

Payment of interest and repayment of principal to holders of a government's debt instruments. (p. 7)

Debt Service Fund

A fund established to provide for the payment of principal and interest on long-term debt. Also called a sinking fund.

Debt Service Reserve

Funds set aside (usually from issue proceeds) to provide additional security for a debt obligation. The amount is usually equal to either average annual debt service or maximum annual debt service. (p. 10)

Deficit

(1) The excess of the liabilities of a fund over its assets. (2) The excess of expenditures over revenues during an accounting period, or in the case of proprietary funds, the excess of expense over income during an accounting period.

Demand Deposit

A deposit of monies where the monies are payable by the bank upon demand.

Depreciation

The decline in value of a fixed asset over time as a result of wear and tear, deterioration, action of the physical elements, inadequacy, and obsolescence. (p. 41)

Direct Net Debt

Gross direct debt less debt that is self-supporting (revenue bonds) and double-barreled bonds (general obligation bonds secured by earmarked revenues which flow outside the general fund).

Double-Barreled Bonds

General obligation bonds that are initially secured by a stream of revenues or special assessments.

Glossary

Encumbrances

Obligations in the form of purchase orders, contracts, or salary commitments which are chargeable to an appropriation and for which a part of the appropriation is reserved.

Enterprise Fund

A fund established to account for operations (a) that are financed and operated in a manner similar to private business enterprises, where the intent of the governing body is that the costs (expenses, including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges, or (b) where the governing body has decided that periodic determination of revenues earned, expenses incurred, and net income is appropriate for capital maintenance, public policy, management control, accountability, or other purposes. Examples of enterprise funds are those for wastewater treatment systems, water, gas, electric utilities, swimming pools, airports, parking garages, and transit systems. (p. 34)

Enterprise Fund Accounting

Accounting used for government operations that are financed and operated in a manner similar to business enterprises, and for which preparation of an income statement is desirable. Unlike governmental-type funds which are accounted for on the modified accrual basis, enterprise-type funds are accounted for on an accrual basis.

Expenditures

Decreases in net financial resources. Expenditures include current operating expenses which require the current or future use of net current assets, debt service, and capital outlays. (p. 6)

Expenses

Decreases in net total assets. Expenses represent the total cost of operations during a period regardless of the timing of related expenditures. (p. 22)

Fixed Assets

Assets of a long-term character which are intended to continue to be held or used, such as land, buildings, improvements other than buildings, machinery, and equipment.

Floating Debt

Obligations that are payable either on demand or with very short maturities, such as accounts payable, bank loans, or warrants.

Full Faith and Credit

A pledge of the general taxing power for the payment of debt obligations. Bonds carrying such pledges are referred to as general obligation bonds or full faith and credit bonds. (p. 42)

Fund

A fiscal and accounting entity with a self-balancing set of accounts recording cash and other financial resources, together with all related liabilities and residual equities or balances, and changes therein, which are segregated for the purpose of carrying on specific activities or attaining certain objectives in accordance with special regulations, restrictions, or limitations.

Glossary

Fund Balance

The excess of an entity's assets over its liabilities. A negative fund balance is called a deficit. (p. 31)

General Fund

The fund used to account for all financial resources except those required to be accounted for in another fund.

General Obligation Bonds

When a government pledges its full faith and credit to the repayment of the bonds it issues, then those bonds are general obligation (GO) bonds. Sometimes the term is also used to refer to bonds which are to be repaid from taxes and other general revenues. (p. 7)

Generally Accepted Accounting Principles (GAAP)

Uniform minimum standards of and guidelines to financial accounting and reporting. They govern the form and content of the basic financial statements of an entity. GAAP encompass the conventions, rules, and procedures necessary to define accepted accounting practice at a particular time. They include not only broad guidelines of general application, but also detailed practices and procedures. GAAP provide a standard by which to measure financial presentations. The primary authoritative statement on the application of GAAP to State and local governments is the National Council on Governmental Accounting's Statement 1. Every government should prepare and publish financial statements in conformity with GAAP. The objectives of governmental GAAP financial reports are different from, and much broader than, the objectives of business enterprise GAAP financial reports.

Generally Accepted Auditing Standards (GAAS)

Measures of the quality of the performance of auditing procedures and the objectives to be attained through their use. They are concerned with the auditor's professional qualities and with the judgment exercised in the performance of an audit. Generally accepted auditing standards have been prescribed by (1) the American Insititute of Certified Public Accountants (AICPA) and (2) the U.S. General Accounting Office (GAO) in Standards for Audit of Governmental Organizations, Programs, Activities, & Functions (the "yellow" book).

Gross Direct Debt

The total amount of *bonded* debt of a government (general obligation bonds plus revenue bonds).

Industrial Development Bonds

State and local government bonds issued to finance private projects that are usually only backed by revenues from the facility being financed (industrial revenue bond). They are almost always tax-exempt, but only because they satisfy numerous legal requirements regarding the size of issue, use of proceeds, and degree of private-sector involvement. For an explanation of exemptions and restrictions see Section 103(b) of the Internal Revenue Code. (Also called industrial revenue bonds.)

Glossary

Internal Control

A plan of organization under which employees' duties are so arranged and records and procedures so designed as to make it possible to exercise effective accounting control over assets, liabilities, revenues, and expenditures. Under such a system, the work of employees is subdivided so that no single employee performs a complete cycle of operations. Thus, for example, an employee handling cash would not post the accounts receivable records. Moreover, under such a system, the procedures to be followed are definitely laid down and require proper authorizations by designated officials for all actions to be taken. (p. 39)

Investment

Securities purchased and held for the production of income in the form of interest or dividends. (p. 7)

Key Debt Ratios

Figures compiled from a broad cross-section of debt issuers that provide a basis of comparison to determine municipal creditworthiness. (p. 9)

Levy

(Verb) To impose taxes, special assessments, or service charges for the support of governmental activities. (Noun) The total amount of taxes, special assessments, or service charges imposed by a governmental unit.

Liability

Debt or other legal obligation arising out of transactions in the past which must be liquidated, renewed, or refunded at some future date. This term does not include encumbrances.

Limited Liability Bonds

When a government issues bonds which do not pledge full faith and credit of the jurisdiction, it issues limited liability bonds. Typically, pledges are made to dedicate one specific revenue source to repay these bonds, or some other special repayment arrangements are made.

Line Item Budget

A budget prepared along departmental lines that focuses on what is to be bought.

Liquidity (of Investments)

The ability to convert an investment to cash promptly with minimum risk to principal or accrued interest. (p. 43)

Maturities

The dates on which the principal or stated values of investments or debt obligations mature and may be reclaimed. (p. 22)

Glossary

Modified Accrual Basis of Accounting

The accrual basis of accounting adapted to the governmental fund type. Revenues are recognized when they become both "measurable" and "available to finance expenditures of the current period." Expenditures are recognized when the related fund liability is incurred except for: (1) inventories of materials and supplies which may be considered expenditures either when purchased or when used; (2) prepaid insurance and similar items which need not be reported; (3) accumulated unpaid vacation, sick pay, and other employee benefit amounts which need not be recognized in the current period, but for which larger-than-normal accumulations must be disclosed in the notes to the financial statements; (4) interest on special assessment indebtedness which may be recorded when due rather than accrued, if approximately offset by interest earnings on special assessment levies; and (5) principal and interest on long-term debt which are generally recognized when due. All governmental funds and expendable trust funds are accounted for using the modified accrual basis of accounting.

Net Income

The excess of operating revenues, nonoperating revenues, and operating transfers-in over operating expenses, nonoperating expenses, and operating transfers-out.

Net Interest Cost (NIC)

The average interest rate on a bond issue, used as an equivalent of simple interest and the amount of the issue. (p. 24)

Objects of Expenditure

Expenditure classifications based upon the types or categories of goods and services purchased. Typical objects of expenditure include:

- personal services (salaries and wages);
- contracted services (utilities, maintenance contracts, travel);
- supplies and materials; and
- capital outlays.

Official Statement

A legal document which summarizes all the salient features of the underlying documents and agreements which support a municipal bond offering. It is considered the disclosure document which presents information that is "material" to the offering. The official statement should contain everything a reasonable investor would need to know in making a decision about the issue. Thus this document will usually include a description of the issuer, a description of the security of the bond, a summary of the principal financing documents, any feasibility studies which relate to the security, and any other "key information." (p. 16)

Operating Budget

Plans for current expenditures and the proposed means of financing them. The annual operating budget (or, in the case of some State governments, the biennial operating budget) is the primary means by which most of the financing acquisition, spending, and service delivery activities of a government are controlled. The use of annual operating budgets is usually required by law. Even where not required by law, however, annual operating budgets are essential to sound financial management and should be adopted by every government. (p. 10)

Glossary

Operating Expenses
Proprietary fund expenses which are directly related to the fund's primary service activities. (p. 34)

Operating Income
The excess of proprietary fund operating revenues over operating expenses. (p. 26)

Operating Revenues
Proprietary fund revenues which are directly related to the fund's primary service activities. They consist primarily of user charges for services.

Operation, Maintenance and Replacement
Activities required to assure the dependable and economical function of treatment works. (1) Maintenance: Preservation of functional integrity and efficiency of equipment and structures. This includes preventive maintenance, corrective maintenance, and replacement of equipment. (2) Operation: Control of the unit processes and equipment which make up the treatment works. This includes financial and personnel management records, laboratory control, process control, safety, and emergency operation planning. (p. 16)

Opportunity Cost
The return in benefit that would have been received if an alternative course of action had been pursued.

Overall Net Debt
The sum of direct net debt and overlapping debt.

Overlapping Debt
The proportionate share of the debt of local governments located wholly or in part within the limits of the reporting government which must be borne by property within the reporting government.

Purchase Order
A document which authorizes the delivery of specified merchandise or the rendering of certain services and the making of a charge for them.

Quarterly Expenditure Plan
The annual budget for a governmental activity can be subdivided into four three-month budgets, called quarterly expenditure plans. They can be used to monitor actual expenditures more closely and to identify problems more quickly than can be done with the annual budget.

Replacement
Obtaining and installing equipment or accessories which are necessary during the useful life of the treatment works to maintain the capacity and performance for which such works were designed and constructed. (p. 8)

Replacement Cost
The cost as of a certain date of a property which can render similar service (but which need not be of the same structural form) as the property to be replaced. (p. 8)

Glossary

Requisition

A written demand or request, usually from one department to the purchasing officer or to another department, for specified articles or services.

Reserve

An account used to indicate that a portion of fund equity is legally restricted for a specific purpose or not available for appropriation and subsequent spending. (p. 8)

Revenue

The term designates an increase to a fund's assets from sources other than refunds, capital contributions, residual equity transfers, loan proceeds, or transfers-in. (p. 8)

Revenue Bonds

Bonds whose principal and interest are payable exclusively from earnings of an enterprise fund. In addition to a pledge of revenues, such bonds sometimes contain a mortgage on the enterprise fund's property. (p. 8)

Revenue Debt Capacity

The amount of revenue debt that can be secured by the stream of revenue pledged to redeem that debt. (p. 10)

Revenue Estimate

A formal estimate of how much revenue will be earned from a specific revenue source for some future period; typically, a future fiscal year.

"Rolling" the Notes

The reissuance of short-term debt at maturity to provide additional time to either complete construction of the facility being financed or to redeem the debt.

Serial Bonds

Bonds whose principal is repaid in periodic installments over the life of the issue. (p. 26)

Sewer Service Charge

The total system charge for wastewater treatment services, including user charges and debt service charges.

Sinking Fund

A fund established to account for the accumulation of resources for, and the payment of, the principal and interest of general long-term debt. (p. 26)

Special Assessment

A compulsory levy made against certain properties to defray part or all of the cost of a specific improvement or service deemed to primarily benefit those properties.

Special Assessment Bonds

Bonds payable from the proceeds of special assessments. If the bonds are payable only from the collections of special assessments, they are known as special assessment bonds. If, in addition to the assessments, the full faith and credit of the government are pledged, they are known as general obligation special assessment bonds or double-barreled bonds.

Glossary

Special Assessment District

A legally established area for the express purpose of levying a special fee for public improvements that are of a special rather than general benefit. (p. 9)

Special Assessment Fund

A fund used to account for the financing of public improvements or services deemed to benefit primarily the properties against which special assessments are levied.

Special District Bonds

Bonds issued by a special district.

Tax Rate Limit

The maximum legal rate at which a municipality may levy a tax. The limit may apply to taxes raised for a particular purpose or for general purposes.

Term Bonds

Bonds which mature in a single, large block on some future date (usually 10-20 years). Redemption is usually made from funds deposited into a sinking fund each year. (p. 26)

Transfer

The movement of monies from one fund to another. (p. 8)

Unit Cost

A term used in cost accounting to denote the cost of producing a unit of product or rendering a unit of service; for example, the cost of treating 1,000 gallons of sewage.

User Charge or User Charge System

A charge or system of charges levied on users of a treatment works for the user's proportionate share of the cost of operation and maintenance (including replacement) of such works under sections 204(b)(1)(A) and 201(h)(2) of the Clean Water Act. (p. 6)

Variable Cost

A cost that increases or decreases with increases or decreases in the amount of service provided, such as the payment of a salary.

Voucher

A written document which is evidence of the propriety of a particular transaction and typically indicates the amounts to be affected by the transaction.

Warrant

(1) A certificate enabling the bearer to purchase additional bonds of a particular entity within a limited time period at a pre-specified coupon rate. (2) A short-term security that represents a liability of the issuer to be paid on a certain date, often placed directly with a vendor or a bank.

Yield

The rate earned on an investment based on the price paid for the investment, the interest earned during the period held, and the selling price or redemption value of the investment. (p. 43)

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