

Emission Reduction Banking and Trading Publication No. BG200



Emission Reduction Banking Manual



Emission Reduction Banking Manual

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AN INTRODUCTION TO BANKING

An emission reduction banking system offers communities and industry an attractive means of reducing the burden of meeting air quality goals. By providing both new and existing firms with increased flexibility in meeting pollution control requirements, a banking system works to reduce both the direct and indirect (e.g., uncertainty and delay) costs of compliance with the Clean Air Act. A banking system enables firms to receive credit for reducing their emissions beyond required levels of control, therefore providing an incentive for additional investment in pollution abatement. A banking system also provides a mechanism for communities to encourage economic development without compromising efforts to improve air quality.

A banking system enables firms to receive credit for reducing their emissions beyond required levels of control.

A banking system is simply an extension of an air pollution control agency's ongoing regulatory efforts. Banking builds on this base by establishing accounting and administrative procedures related to the creation and certification of surplus emission reductions that can be "banked" or stored by firms and used for:

- Offsets--to allow firms to locate and expand in nonattainment areas without degrading air quality;
- Bubbles--to allow existing firms to reduce their costs of meeting current emission limitations; and
- Prevention of Significant Deterioration (PSD)--to allow new firms locating in attainment areas to satisfy new source requirements.

A number of communities (e.g., Louisville, Seattle, San Francisco) already have incorporated banking into their regulatory programs. Many more are now in the process of developing a set of banking rules designed to meet the specific needs of their communities.

This manual draws on the experience of these initial efforts to develop banking systems. It is designed to serve as a guide to state and local agencies and industry in developing banking programs for their localities.

1.1 The Purpose of the Banking Manual

Banking is a flexible program, containing a number of important design options. Before

adopting a banking rule, a community will want to closely examine the implications of alternative designs in the context of its particular pollution and economic development characteristics.

The U.S. Environmental Protection Agency has issued a start notice for a federal regulation concerning banking.

This regulation will not require state and local governments to adopt a banking and trading program. Banking is strictly an optional program. Nor will the regulation impose a specific design on localities electing to adopt a banking program. Rather, it sets forth basic principles inherent in the Clean Air Act (e.g., the maintenance of Reasonable Further Progress, demonstration of attainment) that cannot be violated by the operations of a banking and trading program. The federal regulation will provide a benchmark against which state and local governments can evaluate the legality of the design of their proposed banking programs, while also providing industry some degree of assurance that their investments in pollution control will be protected.

This manual serves primarily as guidance to state and local agencies developing banking programs. It explains the basic administrative steps and design options that fall within the bounds and conditions that will be specified by the upcoming EPA banking regulation. The alternatives discussed in this manual, however, are not exhaustive and localities are encouraged to explore innovative banking designs as long as they comply with Clean Air Act requirements.

1.2 What is "Banking?"

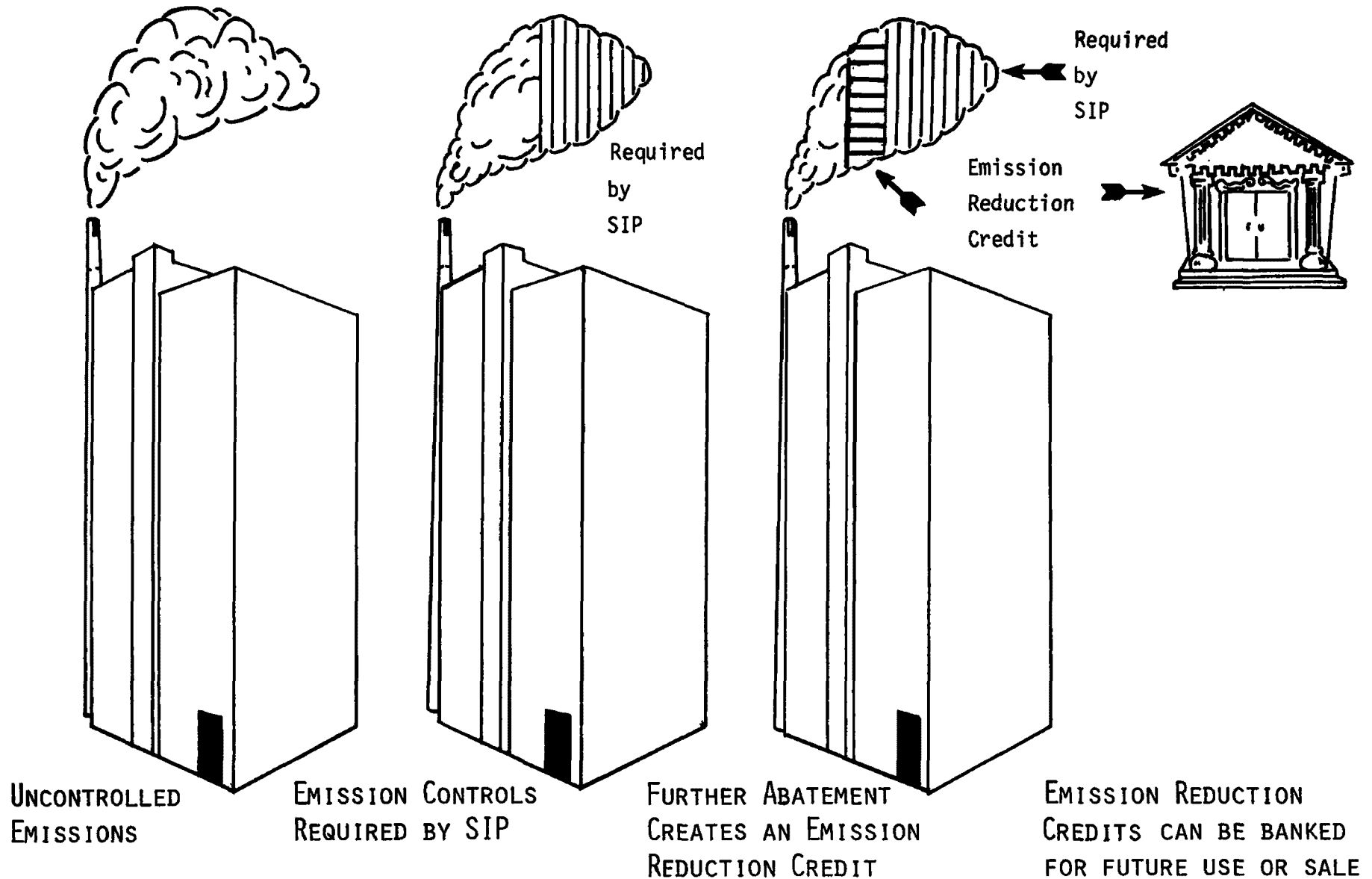
"Banking" is an important regulatory reform recently initiated by the EPA that seeks to encourage greater economic efficiency in meeting the requirements of the Clean Air Act.

A banking program establishes the administrative process by which a firm can receive credit for reducing its emissions beyond the baseline level required in the State Implementation Plan (SIP). The resulting "Emission Reduction Credit" forms the basis for a banking program. (See Exhibit 1.) Rules governing the creation, and use of Emission Reduction Credits constitute the banking system.

Emission Reduction Credits (ERCs) become an important asset to a firm for a number of reasons. A firm has the option of earning a profit on its investment in pollution control

EXHIBIT 1

CREATING AN EMISSION REDUCTION CREDIT



by selling its ERCs to another firm, or it can use these credits itself--as offsets, in a bubble application, or to satisfy PSD requirements.

A banking system establishes the rules by which firms can create and use Emission Reduction Credits.

Banking and Emission Offsets

The emission offset program developed from the need to allow for industrial growth without adversely affecting air quality. Under the Clean Air Act, EPA established health-based ambient air quality standards and identified areas of the country which violated these standards. For those areas designated as "nonattainment," states were required to develop and enforce implementation plans calling for reductions in emissions necessary to achieve the desired level of air quality by 1982 for most pollutants, with a possible extension to 1987 for automobile-related emissions.

Efforts to reduce emissions from existing sources have generally progressed well. In most areas, the air is getting cleaner. But in many places, major metropolitan areas in particular, air quality still violates healthful levels.

Because of technological limitations, even with the most effective pollution abatement equipment new industrial development necessarily adds to the pollution problem in nonattainment areas. The original Clean Air Act adopted in 1970 offered a simple but not very practical solution to this problem--it prevented new industrial growth in all nonattainment areas. In 1976, EPA adopted an attractive alternative. Under the emission offset policy, new sources wanting to locate in nonattainment areas must install the most advanced control technology possible and must arrange for equivalent reductions in emissions from existing sources that more than "offset" its own emissions. This policy was incorporated into the 1977 amendments to the Clean Air Act and has been adopted by many states as a means of allowing new industrial growth in nonattainment areas without compromising efforts to attain cleaner air.^{1/}

^{1/}EPA issued an interpretative order on January 16, 1979 explaining the Section 173 offset provisions in the Clean Air Act. See Federal Register, Vol. 44, p. 3274. This federal policy was only in effect until states issued their own nonattainment strategies as part of their 1979 SIP revisions. Many states, however, incorporated the basic elements of EPA's interpretative order into their own rules.

Emission Reduction Credits provide a ready supply of emission offsets. They represent reductions in emissions from existing sources that have already been certified by the air pollution control agency and can be applied to offset emissions from new development in nonattainment areas. Their use as offsets should significantly aid a firm's search for acceptable offsets. In areas with a banking program, firms in need of offsets can simply examine the central ERC registry to determine the availability and source of offsets.

Banking and the Bubble

The "bubble" provides existing firms with increased flexibility in complying with current emission requirements.^{2/} It is a major variation of the conventional regulatory approach that sets specific emission restrictions at each emission point within a facility. Under this program reform, a firm can construct a "bubble" around emission points and arrange controls so that its overall limits are satisfied. Thus, the bubble allows plant managers the option of reducing emissions beyond existing requirements (i.e., create an Emission Reduction Credit) at emissions points where control costs are relatively low in lieu of reducing emissions from points where controls are expensive.

Firms are permitted to bubble within a facility or across facilities. Two different firms can even arrange to bubble between their facilities.

The bubble offers sources the opportunity to capture potentially significant savings. Firms are permitted to bubble within a facility or across facilities. Two different firms can even arrange to bubble between their facilities. All that is necessary is a demonstration that the surplus emission reduction is enforceable and compensates for the corresponding relaxation of controls.

To bubble, a firm must first reduce its emissions from one of its sources beyond the required amount. By doing so, the firm is in effect creating an Emission Reduction Credit. Banking provides for the systematic treatment of that surplus emission reduction. It reduces the uncertainty involved in applying to use the bubble, gives firms greater flexibility in deciding when to bubble, and provides a vehicle for bringing together firms that may want to bubble between their plants. By adopting a banking program, a community will be taking a significant step towards assisting local industry's use of the bubble to reduce its costs of pollution control.

^{2/}EPA's Bubble Policy was published in the Federal Register on December 11, 1979 (Vol. 44, p. 71780).

Banking and Prevention of Significant Deterioration

In order to insure that air quality is not significantly degraded, new or expanding sources locating in attainment areas must satisfy the requirements of the prevention of significant deterioration (PSD) program.^{3/} There are two potential uses for Emission Reduction Credits in the context of this program. ERCs created within a plant could be used by firms contemplating expansions or modifications in their existing facilities to reduce the net change in total emissions to a point below the threshold level triggering PSD new source review. In cases where PSD requirements are imposed, ERCs can also be used to satisfy offset requirements that result from violations of increment limitations.

Once an ERC has been created and banked, firms have maximum flexibility in deciding how best to use this asset--as an offset, in a bubble application, or to satisfy PSD requirements. See Exhibit 2. Regardless of the use it selects, a firm is better able to plan for future expansion and to minimize the costs of its compliance strategy by having these emission reductions on hand.

1.3 The Advantages of Banking

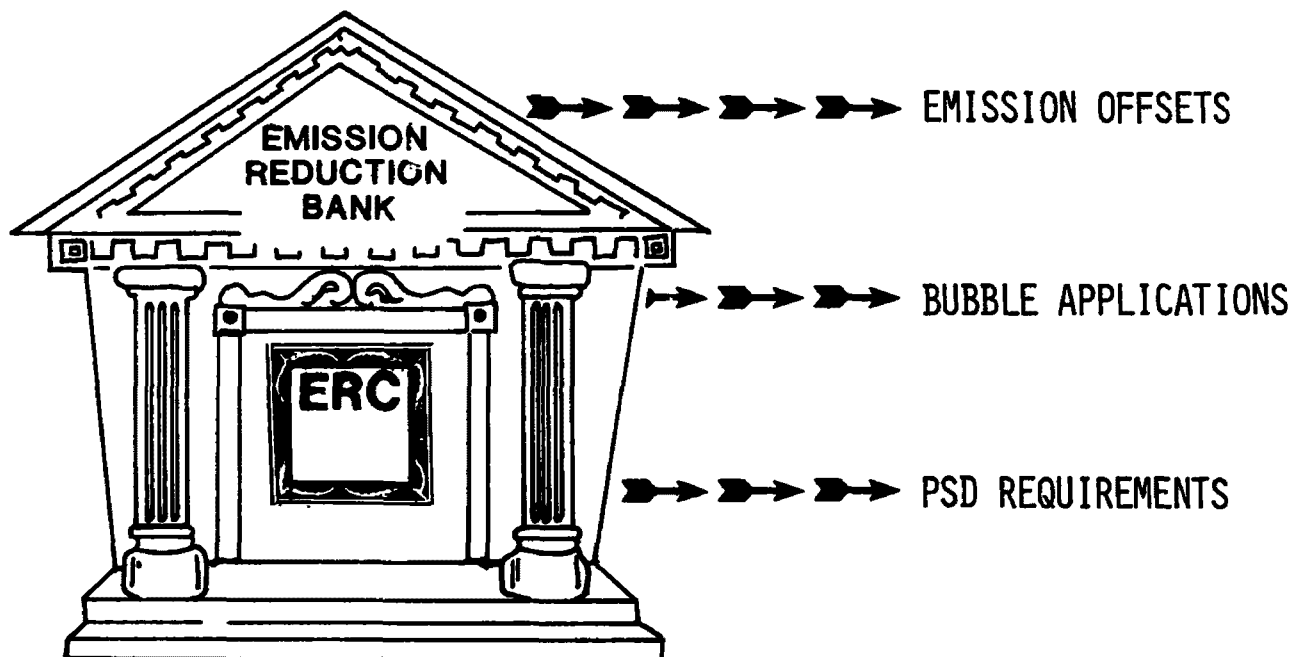
Firms have arranged for offsets and have applied to use a bubble in the absence of a banking system. How then can a banking program aid in the use of these programs? By providing for a systematic treatment of emission reductions, a formal banking program offers a number of distinct advantages for both air pollution control agencies and industry.

From an air pollution control agency's perspective, banking:

- increases the agency's flexibility in developing and implementing a plan to achieve and maintain air quality standards;
- establishes a set procedure for evaluating new source review and bubble applications--one that insures consistency with Clean Air Act requirements; and
- provides an incentive for firms to reduce their emissions beyond existing requirements.

EXHIBIT 2

THE SEVERAL USES OF ERCs



^{3/}Specific rules concerning the use of emission reductions in the context of PSD requirements are explained in EPA's final regulations that are forthcoming in July. These regulations reflect changes in the program in order to comply with the Alabama Power v. Costle decision.

From the standpoint of industry, a banking system is also attractive. Banking:

- provides an economic reward for a source that lowers its emissions below the required level;
- encourages technological innovation;

- reduces uncertainty and delay and therefore allows firms to plan ahead for future plant expansions, knowing that emission offsets are in hand; and
- facilitates the use of the bubble, therefore allowing existing firms to minimize the cost of complying with current and future emission standards.

Banking may also lower the overall costs of achieving a specified standard. When firms are required to reduce their emissions, they will have the option of evaluating different levels of investment in pollution abatement equipment. They may elect a control system more effective than required, if they can bank the resulting surplus emission reductions. Exhibit 3 illustrates how it is generally less expensive to install the most efficient controls possible, rather than adding additional controls in the future should that be necessary. Pollution abatement equipment typically cannot be designed and installed incrementally--to achieve additional reductions, production processes must be halted and existing control systems must often be scrapped. To avoid the unnecessary costs associated with two-stage retrofits, firms have the option of installing the most cost-effective equipment available and will receive credit for any surplus emission reductions that result.

Because of these advantages, the adoption of a banking program will:

- facilitate greater cooperation among air pollution control agencies and the sources they regulate;
- improve the efficiency of achieving and maintaining environmental quality; and
- remove some of the existing impediments to economic development.

Despite these advantages, in localities that adopt a banking program, a question arises as to whether firms will come forward to bank and receive credit for the emissions reductions they create, rather than simply holding onto them until the time they plan to sell or use them. In the absence of a detailed set of equitable rules, firms will not invest in controls to create Emission Reduction Credits. Without a clear set of rules that provide some measure of protection for Emission Reduction Credits stored in the bank--particularly a provision that safeguards banked ERCs in the case of further controls required to meet ambient air quality standards--it is unlikely that firms will declare and bank their emission reductions.^{4/}

If some degree of protection for banked ERCs is clearly established in the locality's banking rules, a number of reasons exist for

^{4/}See Section 2.4 of the manual for a discussion of design options for handling banked ERCs in the event of a SIP adjustment to re-establish Reasonable Further Progress.

firms to participate in the banking program. By banking their surplus emission reductions, firms have a means to protect these emission reductions. In the future, if additional abatement is required to achieve ambient air quality standards, existing surplus emission reductions would likely be incorporated into the State's revised control strategy. Surplus emission reductions not banked and credited to a firm will not be protected and will likely be included as part of the revised demonstration of attainment. Moreover, under Section 172(b)(4) of the Clean Air Act, states are required to annually update their emission inventories to reflect "actual" emissions. Thus, states are required to incorporate into their air quality plans any voluntary reductions by firms.

Emission Reduction Credits will be protected by the rules of the banking system.

By banking and receiving credit for their surplus emission reductions, firms will legitimize their hold on these emission reductions. Perhaps, more importantly, the future use of these emission reductions will be facilitated because their validity and size will already have been confirmed by the air pollution control agency prior to the time when they are sold or applied to a permit application.

1.4 Who Should Develop a Banking Program?

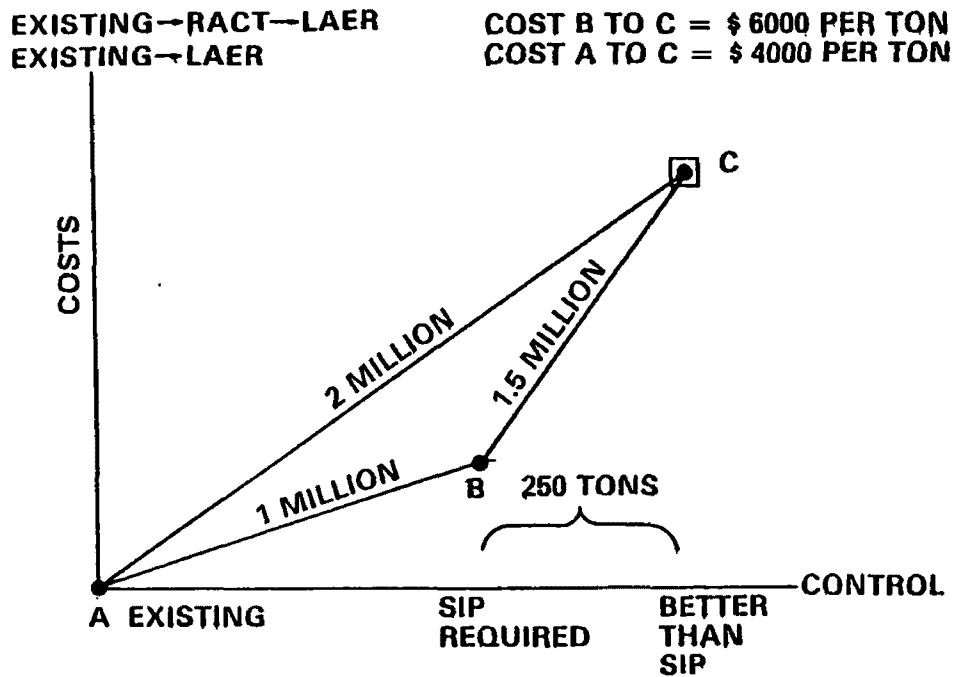
The first question a state or locality should ask of itself is whether a banking program would significantly enhance its efforts to satisfy the requirements of the Clean Air Act. Different communities have different pollution problems and different economic development goals, and in some situations, banking may not contribute to their clean-up efforts.

The impetus for a banking and trading program could arise from a number of sources. Firms considering a change in their production processes or their compliance strategies may inquire about the possibilities of banking surplus emission reductions which result from these actions. Economic development agencies interested in finding new ways to remove any environmental constraints in attracting industry to their communities are a second group likely to be interested in banking. New firms in search of offsets, or existing firms seeking to bubble in order to reduce their cost of meeting current requirements may also be the driving force behind the creation of a banking system.

Experience has shown that several candidate organizations could take the lead in designing and developing a banking program. (See Exhibit 4.) For example, in San Francisco, the local Air Quality Management District along with the regional business

EXHIBIT 3

HOW BANKING CAN REDUCE THE DIRECT COSTS OF CONTROL



Banking gives firms the option of controlling emissions more than required to satisfy a standard based on reasonably available control technology (RACT).

- (1) The difference between RACT and more stringent controls can be banked and becomes a valuable asset.
- (2) If control requirements are further tightened, the banked emission reductions may be used to satisfy the new emissions limit at a substantial saving (here \$.5 million) to the firm.

association was responsible for the adoption of a banking program.

In designing a banking system, both the characteristics of the existing air program

during the design stage of developing the program.

Operating the banking program primarily involves regulating the creation and use of

EXHIBIT 4

ORGANIZATIONS RESPONSIBLE FOR DEVELOPING BANKING PROGRAMS

LOUISVILLE, KY
SAN FRANCISCO, CA

SEATTLE, WA

COUNTY AIR POLLUTION CONTROL BOARD
LOCAL AIR AGENCY/REGIONAL BUSINESS
ASSOCIATION
REGIONAL AIR POLLUTION CONTROL AGENCY

and the economic development needs of the locality should be carefully considered. For example, in older industrial cities, where preserving jobs from existing industry will probably have a higher pay-off than seeking

Several indicators a community should examine to determine whether banking would be a useful extension of its ongoing air pollution control programs include:

- the existence of a significant number of medium to large industrial firms with facilities of varying ages;
- a concern that industrial firms are closing down and leaving the area;
- a desire to assist new firms wanting to locate in the area;
- a concern that existing firms are selecting alternative locations to expand;
- some likelihood that ambient air quality standards may not be achieved by the legislated deadlines; and
- a desire to modernize the industrial base by encouraging more rapid replacement of existing facilities.

to attract new industry, a banking program should be designed both to help economic development officials attract new industry, and to facilitate the use of the bubble to aid existing firms to reduce their costs of control. The use of ERCs in the bubble should also serve to save jobs by prolonging the life of existing facilities without degrading air quality. To assure that the design of the banking system meets the needs of all affected parties, steps should be taken to incorporate their views and concerns

Emission Reduction Credits. These functions fall squarely within the purview of the air pollution control agency. Air pollution control agencies should not, generally, become involved in the actual trading of Emission Reduction Credits (e.g., setting prices, bringing together buyers and sellers). Trading activities--and using banking as a means of encouraging economic growth--should be undertaken by economic development agencies, metropolitan planning organizations, and industry associations.

A trading system can expand the benefits of banking.

1.5 How To Use This Manual

The organization of this manual distinguishes between the design of the banking system and the start-up and operation of the system.

Part 2 presents an overview of the design of a banking system and then discusses in detail its five basic components. It also presents many of the design options possible for each component.

Part 3 focuses on the process a state or SIP designated locality will employ in developing and administering a banking program. It explores possible avenues for financing the start-up of a system, and discusses the administrative resources required for operation.

The appendices include a glossary of key terms used in this manual and an annotated bibliography describing related publications available from EPA.

PART 2: DESIGNING A BANKING SYSTEM

Before presenting the details of an emission reduction banking system, a brief overview may be helpful. The introductory section presents:

- a discussion of the nature of the commodity, "Emission Reduction Credits," that serves as the basis for the banking system; and
- a summary of the five components of the system.

Defining Emission Reduction Credits

There is an important distinction between the "emission reductions" (the physical reduction of emissions by a source) and Emission Reduction Credits (the commodity that is to be banked). Because a source reduces its emissions by 100 tons, this does not necessarily mean that either it or another source that purchases these credits has the right to pollute an additional 100 tons. The use of Emission Reduction Credits is subject to the rules governing the particular permit context (e.g., offsets or bubble applications) to which it is applied. In order to avoid confusion between the physical pollution units and the intangible commodity which is banked and ultimately used, the former are termed "emission reductions" and the latter are termed "Emission Reduction Credits".

Credit will only be issued for emission reductions that are:

REAL—only reductions in actual emissions;
PERMANENT—only reductions that will be maintained over time; and
ENFORCEABLE—only reductions that legally bind the source and can be administered by the regulatory agency.

Although APCAs have considerable flexibility in defining what is acceptable as an ERC, the basic principles of real, permanent and enforceable must not be violated.

Credits will entitle sources to meet certain requirements in State Implementation Plans for either obtaining new source permits or for meeting emission limits at existing sources. The use of ERCs must meet sufficiency and equivalency tests. Credits do not automatically entitle sources to increase their pollution; nor are these credits absolute entitlements or property rights of interminable duration. Major SIP revisions necessary to meet ambient air quality standards may require the regulatory agency to make adjustments in the amount of credit

which has been granted to sources that have created surplus emission reductions. Provisions in a banking system must take into account this possibility.

Any necessary adjustments in banked emission reductions must be equitable. It is essential that the value of a credit be made as certain as possible if the banking opportunity is to attract additional investment in pollution controls. For example, if there were a SIP revision necessitating some adjustment, a rule requiring similar percent reductions from the quantity of banked credits and from uncontrolled emissions that are part of the inventory would be equitable and would safeguard the value of the credits to a firm.

The Components of a Banking Process

There are five components of a banking system. Exhibit 5 presents a simulated overview of the banking process. This process is summarized below in the context of its five distinct components:

COMPONENT 1: QUALIFYING EMISSION REDUCTIONS

This requires the reduction of emissions by a source below the baseline amount of actual emissions implied in the approved SIP's demonstration of attainment. This can be done by installing controls, altering operating parameters or inputs, or cutting back or closing operations. Only those emission reductions that satisfy explicit qualifications will receive banking credit.

COMPONENT 2: QUANTIFYING EMISSION REDUCTIONS

Some formal administrative mechanism is needed to verify and endorse the quantity of emission reductions created by the source. A source would apply to have its permit changed to reflect the lower emission reduction level which it had achieved, thereby legally binding itself to emit at the lower level.

COMPONENT 3: CERTIFYING THE ERCs

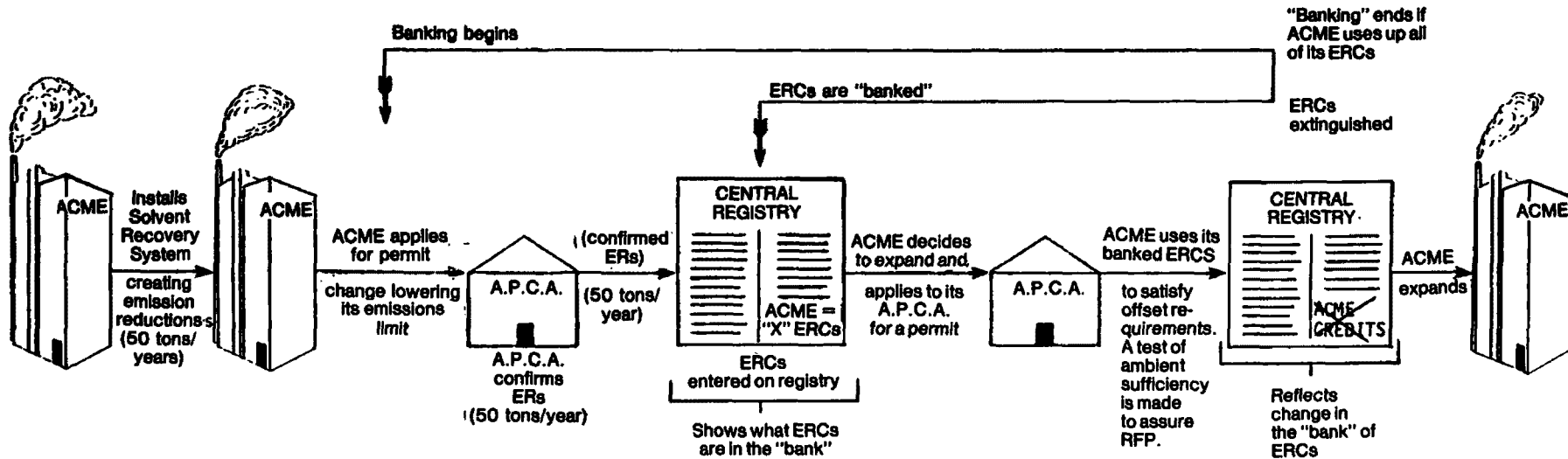
During this component, the emission reductions will be converted into Emission Reduction Credits (ERCs) and entered into the SIP. To be certified, an emission reduction must be real, permanent, and legally enforceable. ERCs represent the actual commodity being banked. The ERCs are certified and credited to the source by entry on a central registry.

COMPONENT 4: BANKING AND ACCOUNTING FOR THE ERCs

This, in effect, is the means by which a source "stores" its ERCs for later use. While ERCs remain on the registry, appearing in the account of the creating source, the ERCs are "banked". If a SIP revision is necessary to demonstrate attainment with Clean Air Act standards, the quantity of ERCs may need to be adjusted.

EXHIBIT 5

BANKING PROCESS OVERVIEW: AN EXAMPLE



An example may help. ACME has installed a solvent recovery system and has reduced its emissions (by 50 tons per year) below the baseline. ACME applies for a permit change (i.e., to require the reduced emissions) and thereby becomes involved in "banking." The real size of the emission reduction that will result from the controls proposed (not the changing of the permit) must be calculated. The confirmed ERs are converted into ERCs, are entered into the central registry, and the SIP is changed. ACME's ERCs are now "banked" and ACME is still involved in "banking." The ERCs (ACME's and those of others) that are credited on the

central registry are the "bank" of ERCs. At some later date, ACME decides to expand its facilities and uses some or all of its ERCs to satisfy offset requirements necessitated by the expansion. The use of the ERCs to expand is reflected in the permit, and ACME's ERC account in the central registry will be debited for the amount of credits used to satisfy permit requirements. When this is done, ACME's ERCs which have been used cease to exist (and thus are no longer banked), and if ACME has used up all its ERCs, it no longer is engaged in banking. However, the bank of ERCs still exists (i.e., with all the remaining ERCs which sources have not used).

COMPONENT 5: USING BANKED EMISSION REDUCTION CREDITS

The source which has "banked" its ERCs can subsequently use these ERCs to satisfy emission limitations or new source review requirements. ERCs are converted into physical pollution allowances; the permit or its equivalent emission limitation in the SIP is changed to reflect the amount of ERCs being used by the source; and the ERCs used are extinguished and debited to the source's account in the central registry.

The following five sections present each of the essential components of a banking system in more detail. For each component there is first presented a discussion of its rationale, followed by an explanation of its key issues, and a summary.

2.1 Component 1: Qualifying the Emission Reduction

The initial component of a banking system requires the establishment of rules governing the qualification of emission reductions (ERs).

In establishing rules for the qualification of emission reductions, the principal objective is to encourage their production without jeopardizing the attainment and maintenance of ambient air quality and without creating an undue administrative burden. The key to the successful design of the first component of a banking system is to achieve the proper balance among these factors.

Rules governing the qualifications of emission reductions are necessary because not all sources and not all reductions in emissions will be acceptable for the purpose of banking. For an emission reduction to be banked the Air Pollution Control Agency (APCA) must be assured that it is real, permanent, and enforceable; was created in a manner acceptable under the banking rules; and was created from a source which is eligible to bank. In designing a banking rule, three issues relating to possible qualifications for banking should be addressed:

- What types of emission reductions can qualify for banking?
- What sources are eligible to bank emission reductions?
- What is the role of the APCA in qualifying emission reductions?

WHAT TYPES OF EMISSION REDUCTIONS CAN QUALIFY FOR BANKING?

Not all emission reductions can qualify for banking. Agencies should develop and publish rules or guidelines to discourage uninformed or frivolous proposals.

There are a number of reasons why certain types of emission reductions will not qualify for banking. The Clean Air Act (CAA) and its requirements set minimum qualifications for what emission reductions can be banked. The manner in which the SIP was designed also sets eligibility limits. It is essential that qualifications be clearly established in advance and available to all those potentially interested so that every party is treated fairly.

Clean Air Act Requirements. Implicit in the Clean Air Act are requirements that emission reductions must be real, permanent, and enforceable in order to qualify for banking. Failure to comply with these principles would result in a violation of reasonable further progress and the SIP's demonstration of attainment. In general:

- A "real" emission reduction means that actual air emissions are reduced.
- A "permanent" emission reduction means a reduction that is not temporary, intermittent, or short-lived (e.g., emission reductions from carpooling are frequently only temporary).
- An "enforceable" emission reduction is more than a "promise" of a reduction. It must be an action and a commitment that is legally binding and enforceable in the courts and by the regulatory agency.

These requirements set threshold qualifications for emission reductions. Other tests may have to be met as well in order to get credit for surplus emission reductions.

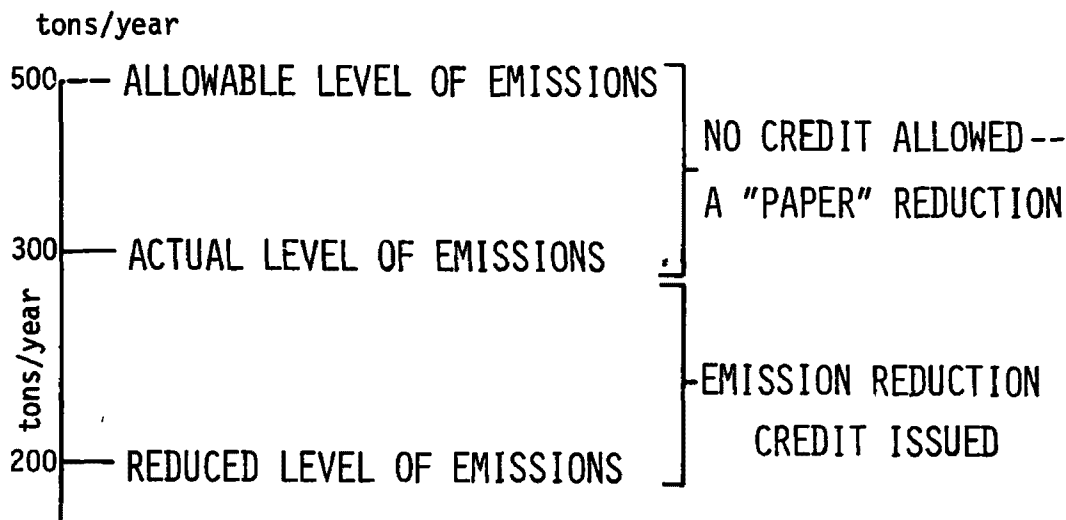
Actual vs. Paper Emission Reductions: SIP Design Affects Eligibility. In designing its SIP, a state has effectively set limits on the eligibility of certain classes of emissions. Eligibility limits include:

- emission reductions from sources not included in the SIP; and
- emission reductions already included in the SIP (explicitly or implicitly).

For example, many sources have typically emitted pollution at levels below the "allowable" level specified in the SIP or in their permits. In almost every case, the ambient air value used for the SIP design and the demonstration of attainment were based on actual emissions. If these sources have their permits changed to allow only the lower level of existing actual emissions and can bank the difference between allowable and actual emissions, this would be a "paper" emission reduction—not a real one. This limitation is illustrated in Exhibit 6.

EXHIBIT 6

ONLY ACTUAL EMISSION REDUCTIONS WILL BE ELIGIBLE IN MOST CASES



Eligibility of "Paper" Reductions. In most cases, only actual reductions in emissions will be eligible for banking. "Paper" reductions can not receive Emission Reduction Credits. "Paper" reductions are a change in permits (or other documentation) that does not reflect a reduction in actual emissions.

If Emission Reduction Credits were given for "paper" reductions, actual ambient air quality would be worsened when the ERCs were finally used. This would clearly contradict the Reasonable Further Progress requirement.

Acceptance

There is one situation where agencies may certify changes in allowables for banking credit. That is where a SIP used "potential ambient air" (e.g., the SIPs demonstration was modeled on the basis of allowable and not actual emissions) as a basis for its emission control strategy. Some state SO₂ and particulate plans may have this feature. This feature results in an implicit built-in margin for firms banking any reductions in their permits below the maximum allowable level and can still be consistent with meeting ambient air standards. If a source wishes to condition its permit, it could be credited for banking without endangering attainment.

Most State Implementation Plans are designed on the basis of monitoring ambient air and therefore take into account actual levels of emissions and not those (higher) levels allowed by source permits. Thus, because the ambient air used in the SIP's demonstration of attainment had not incorporated allowable emissions, Emission Reduction Credits could not be issued to a source solely for the difference between its permitted emissions and its actual ones. To insure compliance with the Clean Air Act, in almost all cases, the baseline for calculating ERCs will be actual emissions. (See Exhibit 7.)

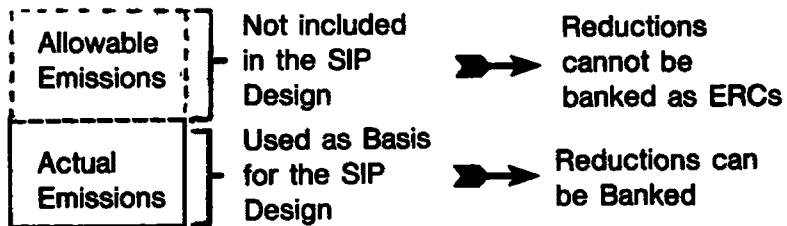
- For example, a source has a permit allowing 500 tons of emissions per day but at the time the SIP was designed it regularly emitted only 400 tons. This source would not be eligible to have the 100 ton difference between its allowed emissions and its actual emissions to be certified as credits. If this were done and the credits later used as an emissions allowance, the state would violate its SIP. Therefore, use of paper credits must be prohibited. A state that tries to adopt a rule that allows paper credits will be creating a basis for disapproval of its SIP.

EXHIBIT 7

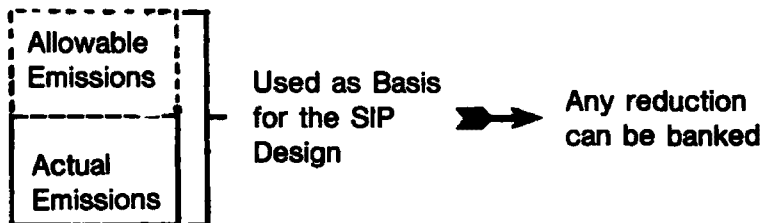
ELIGIBILITY OF "PAPER" REDUCTIONS

Eligibility of pre-existing or paper reductions for banking as Emission Reduction Credits depends on whether the SIP was based on actual or allowable emissions.

In most states, SIPs are based on actual emissions (i.e., ambient air quality monitoring). Thus, paper reductions cannot be converted to ERCs and banked.



In a few instances, the ambient values used to design the SIP included the difference between actual emissions and allowables through modelling. Only if that difference were established by the agency and modeled can firms receive credit for reductions based on allowable emissions.



- If, alternatively, the ambient values used to develop a SIP were based on sources' allowable emissions (as specified in their permits), the situation would be different. Here, the difference between allowable and actual emissions could be certified as credits without violating the SIP.

In its rule, the APCA must determine for each pollutant which of the two cases is applicable and whether allowing the difference between actual and allowable emissions as ERCs would affect its ability to achieve and maintain ambient air quality standards. Without such a determination, a banking program would be in violation of provisions of the Clean Air Act.

Eligibility of emission reductions already in the SIP. Any emission reduction already included as part of the SIP's strategy for reaching attainment would not be eligible for banking. For example, some SIPs base their demonstration of attainment on (among other factors) certain assumptions about the replacement or a change in the mix of major industrial facilities. In this case, plant closings may have already been accounted for in the SIP and could not be credited again for banking.

Similarly, an emission reduction that occurred prior to the development of the SIP, would in general already be incorporated or accounted for, and thus could not be certified for credit. This is because most SIPs are based on measurements of actual ambient air quality--these measurements already incorporate any existing emission reductions.

In many instances, emission reductions may have occurred after the design of the SIP, but before the inclusion of a SIP provision allowing banking. Such reductions may, at the option of the state, be eligible for credit after the banking rule has been enacted. That type of ER represents a real emissions reduction--in terms of how the SIP was designed--and would not interfere with Clean Air Act requirements, but may be excluded by the APCA for administrative or other reasons.

WHAT SOURCES ARE ELIGIBLE TO BANK EMISSION REDUCTIONS?

Eligibility to bank emission reductions may be limited by more than the requirements placed on types of emission reductions. State and local agencies may impose further optional limitations on the sources themselves, as distinguished from the emission reductions created by the source.

Qualifying Minor and Nonconventional Sources

The possibility of qualifying minor sources for banking is an attractive option as a means of avoiding the placement of added control burdens on major stationary sources. Minor sources also represent a potentially inexpensive supply of ERCs.

Bringing minor sources into the banking system may require considerable additional administrative resources, but may nonetheless be desirable in certain localities.

Two basic steps are necessary:

- (1) The baseline for the source must be established, and the source must provide some documentation that this baseline accurately represents its normal level of operation.
- (2) A permit must be devised for the source so that the emission reduction achieved is enforceable.

Some legally enforceable and administratively acceptable mechanism must be employed to assure that reductions in a single minor source's emissions lead to a reduction in total emissions from such sources, as opposed to merely a shift in emissions from one minor source (that receives credit) to another. For example, if one dry cleaner reduced its emissions by shutting down, the likely result would be a shift in business and increased emissions from nearby dry cleaners.

After these two steps are satisfied, the usual administrative steps associated with the banking system can be taken.

The inclusion of nonconventional sources in the banking system presents a more difficult situation. A large quantity of certain pollutants (e.g., particulates, hydrocarbons) are the result of nonpoint sources, including roadways and construction sites. These pollutants are difficult to control, and from the standpoint of an agency confirming a reduction in emissions, they are difficult to measure. Traditional forms of measurement such as engineering analysis and stack tests are inapplicable. Without the ability to measure current emissions and the level of proposed abatement, any award of ERCs to the source would be arbitrary. Yet reductions from these sources do result in improved air quality, may be relatively cost effective to achieve (compared to additional controls on existing major sources), and may be essential to reaching ambient air quality standards.

Nonconventional sources would be very difficult to bring under the banking system. The following three conditions should be met as a condition of allowing nonconventional sources to qualify for banking.

- (1) only permanent changes that can be verified are eligible--for example, the paving of a dirt road;
- (2) the quantity of emission reductions confirmed must be determined by ambient air monitoring or by some other equally effective means; and
- (3) the use of ERCs from these sources might be limited to conditions similar to those from which the ERC was created.

In areas where few major sources exist or where those that do exist are tightly controlled, to achieve ambient air quality standards it may be necessary to bring minor and nonconventional sources into the banking system. Often local governments or quasi-governmental bodies can best capture nonconventional reductions. Because determination of who is entitled to claim a class of emission reductions is a question

of state discretion, it may be advantageous to give rights to these reductions to such bodies when the state develops its rule.

Optional Source Qualifications For Banking

An emission reduction may be eligible for

Ownership Options

There are a number of different options which states can use in fashioning ownership rules for banking programs. For example, certain classes of emission reductions (e.g., area sources) might be reserved for the state or local government. Reductions in emissions from major sources should generally be reserved for the major sources themselves. Without explicit ownership rights, such sources would get nothing from the production of emission reductions and therefore would not likely reduce their emissions beyond required levels.

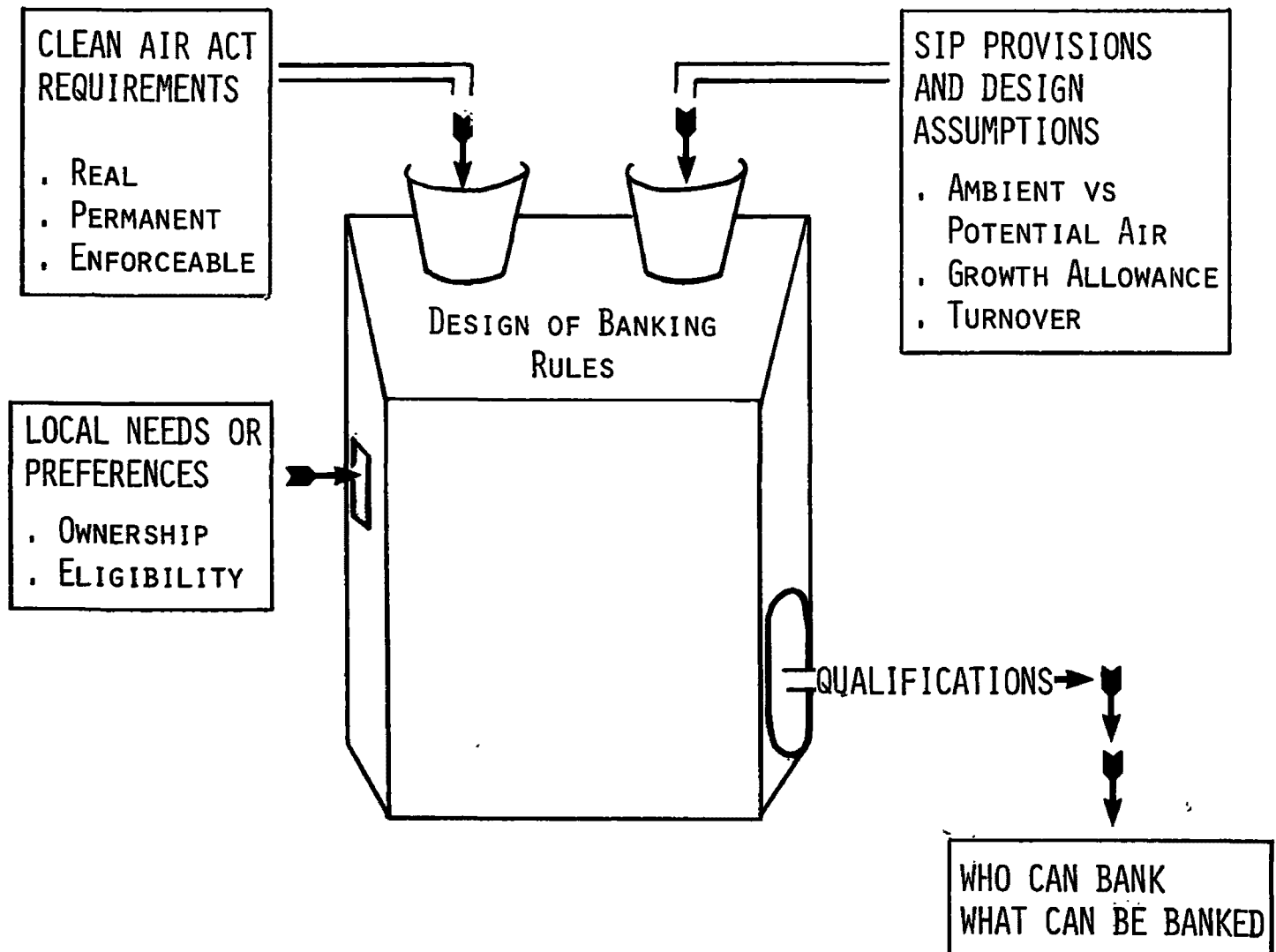
banking if it is consistent with the requirements of the Clean Air Act and with the provisions and design of the SIP. However, state and local agencies are free to enact other eligibility qualifications. (See Exhibit 8.) These are optional and relate to both the type of emission reduction and who can receive credits.

Optional eligibility requirements can further define which emission reductions and source owners are qualified to participate in banking and which are not. Such optional qualifications can be based on a number of different factors. These include:

- method by which the reduction was created (e.g., closings);
- sources for which a baseline cannot be determined;
- compliance status of source;
- size of source or emission reduction;
- forthcoming controls or requirements under study; and
- ownership restrictions.

EXHIBIT 8

DEVELOPMENT OF BANKING QUALIFICATIONS



Receiving credit for emission reduction banking is authorized by the state within limits set by (1) the Clean Air Act and its requirements (2) the SIP and its design, and (3) state and local law. This gives states substantial discretion to establish qualifications based on the above factors. However, such qualifications will need to be objective and rational.

Should Shutdowns be Allowed to Qualify as ERCs? The Pros and Cons

There has been much discussion concerning whether or not emission reductions which result from shutdowns should be allowed to qualify as ERCs. Here are some of the arguments on this issue:

Shutdowns Should not be Allowed as Sources of ERCs

1. Shutdowns often do not result in real reductions in emissions. Often, other facilities in the area will pick up the plant's customers if it is shutdown. The increased emissions of the other plants in the area would result in degrading air quality when ERCs from the shutdown are ultimately used.

2. Shutdowns may already be taken into account in the SIP. It is true that most shutdowns are not specifically provided for, but they may have already been considered in the original demonstration of attainment used in the design of the SIP. If this were the case, to certify ERCs from shutdowns would result in double counting and a worsening of air quality.

Shutdowns Should be Allowed as Sources for ERCs

1. A shutdown is nothing more than a 100 percent reduction in output. If a 99 percent reduction can qualify as an ERC, then so should a 100 percent reduction. A shutdown is merely one end of a continuum from no reduction to total reduction, and every point along that continuum deserves similar treatment.

2. If shutdowns do not qualify for ERC status, then a "marginal" firm will have no incentive to close. Instead this firm will limp along until it can use the emission reductions itself. This will only impede efforts to improve air quality, as well as create economic inefficiency.

3. Shutdowns that are not used by a firm for replacement facilities could be qualified with a portion of the credits going to the state to satisfy Reasonable Further Progress or to be used to attract new investment to the community. The importance of jobs to a community may suggest that, when jobs are lost, ERCs from plant closings should be used to attract replacement companies.

4. Shutdowns may be a cost-effective way to control pollution that raises capital for firms to continue in business, invest, or meet other control requirements. Not giving credit for shutdowns may increase areawide closings.

It is important that the APCA explicitly establish the eligibility rules and that all sources are made aware that restrictions may

be placed on having their emission reductions qualified as ERCs. Once the rules of the banking system are established, including a set of source eligibility criteria, it should be published for comment and, if possible, mailed directly to all potentially affected parties.

Classes of ERCs

One alternative to restricting eligibility entirely is to establish *different classes* of ERCs. Many economic development agencies are particularly interested in obtaining publicly controlled Emission Reduction Credits. Plant closings are one source sometimes discussed as a likely candidate for public control. It should be recognized that creating separate classes of ERCs complicates the system and may affect firms' incentives to reduce emissions. For example, a firm might be reluctant to shutdown a facility if it were not to receive credit for its reduction in emissions. The more complex the system the less likely it is to work.

No source is prohibited from reducing emissions more than required; the eligibility restrictions are imposed when a source goes before the APCA to have the emission reductions converted into ERCs. This process will be discussed in detail in Part 2.2.

What is the Role of the APCA in Qualifying Emission Reductions?

The responsibility for actually creating an emission reduction falls entirely on a source. It is a voluntary decision. Emission reduction can be achieved by various means. Some of the more conventional means include installing control technology (e.g., scrubbers or precipitators), changing input practices (e.g., using natural gas in place of oil), or curtailing operations (e.g., shutting down a source). Individual sources are most likely to create ERs by:

- changes in abatement equipment;
- changes in industrial processes;
- shut-downs or cutbacks in operations that are no longer financially viable, and;
- shifts in fuels used for energy needs.

In each of these situations, a source would weigh the potential advantages gained by creating an emission reduction (for future use) against the costs associated with producing it. Sources need to be aware of eligibility restrictions on particular methods of creating emission reductions.

It is the APCA's responsibility to establish rules concerning the qualification of emission reductions. The role of the APCA does not end, however, after the promulgation and publication of these rules; the APCA can facilitate use of the banking system by making a nonbinding estimate of the credit that it expects to give a source if it meets

certain conditions. The conditions may include factors such as operation and design of process and equipment, and requirements for post-control monitoring. The APCA may also estimate the contingent reductions in ERCs which will occur if various conditions are violated. All of this should help the source to decide whether to proceed.

SUMMARY

The first component of the banking system involves the development of a clear set of rules governing participation in the banking program. The actual physical creation of the emission reduction by the source is but the culminating step in this component. Briefly, Component 1 of the banking system involves three basic activities:

- (1) APCAs must promulgate eligibility and ownership rules (i.e., qualifications) for banking. These are based on three considerations:
 - Clean Air Act requirements;
 - SIP provisions and design assumptions; and
 - local preferences and needs.
- (2) Individual sources must determine whether or not they could qualify a proposed emission reduction--APCAs should be prepared to respond to inquiries.
- (3) APCAs may make an estimate of probable ERCs which could be certified based on certain explicit assumptions and conditions.

The third point becomes the focus of the next component--The Quantification of Emission Reductions.

2.2 Component 2: Quantifying the Emission Reduction

After an emission reduction is created by a source, the reduction must be officially "quantified" by the APCA before it can be certified as a credit and banked.

The function of this component is three-fold:

- (1) To verify the quantity of the emission reduction created: The exact quantity may be in question because the techniques used to measure emission reductions are inexact.
- (2) To verify the permanence of the emission reduction: Permanence of an emission reduction is absolutely essential; if a reduction is not permanent, it cannot be banked.

- (3) To bind the source to the reduced level of emissions: Ideally, this will be achieved through the existing permit system. The permit provides an administrative record which clearly identifies the source, quantity, and characteristics of emission reductions. A firm must either be operating under a permit or be brought under a permit to participate in the banking system. The permit serves the dual functions of:

- establishing a baseline against which proposed reductions can be measured; and
- providing a legally enforceable instrument.

The change in a permit or creation of a new permit must also be incorporated into the SIP to be legally enforceable under the Clean Air Act.

As discussed in the previous section, only actual reductions in emissions will qualify, in most cases, for banking. If more credits are awarded than justified by the actual reduction, air quality will suffer when the ERCs are eventually used. The demonstration of attainment of Clean Air Act standards may also be jeopardized. Thus, accurate measurement must be part of a banking program.

To quantify an emission reduction, an APCA must:

- (1) determine the initial baseline of actual emissions; and
- (2) determine the proposed reduction in emissions.

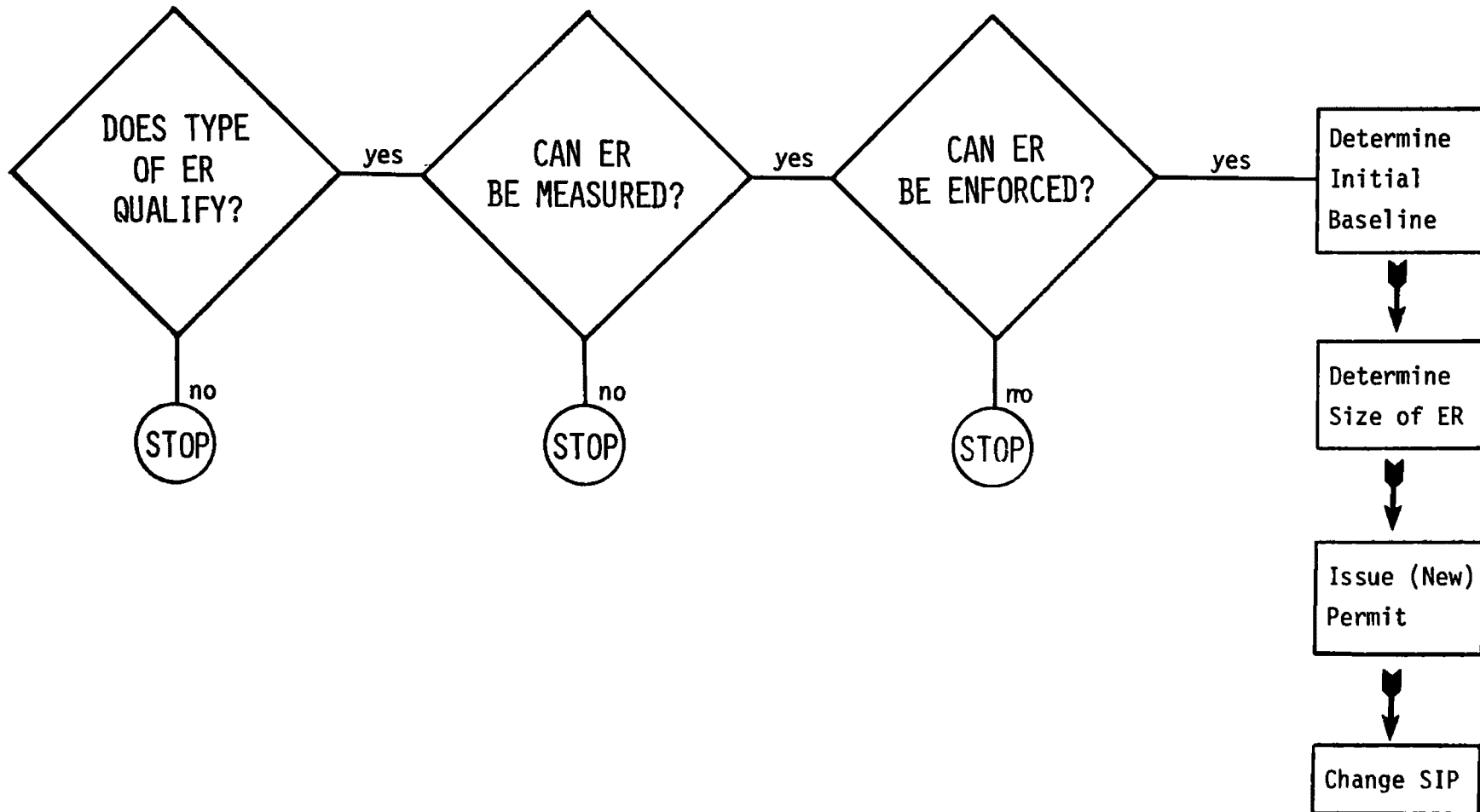
If an emission reduction cannot be measured and quantified, it cannot be certified and banked. Under a banking program, there must be strict accounting for ERCs. Thus, some way for an emission reductions to be quantified must be developed. This will be the most difficult aspect of banking. Where there is uncertainty, APCAs must insist that all claims be verified.

The process of quantifying emission reductions is described in Exhibit 9. The APCA is to determine the quantity and the acceptability of the emission reductions proposed by a source. In most states major sources have specific emission limitations written into their permits or into the SIP. However, these permit limitations will rarely be useable for calculating the emission reductions produced by a particular control. Where a permit specifies an emission limitation, it would be appropriate for use as the baseline only if the source has historically emitted at that level (i.e., if its actual emissions were equivalent to its allowables). This is infrequently the case.

- Permits themselves may not be sufficient documentation of actual past

EXHIBIT 9

**CONFIRMING AND QUANTIFYING
EMISSION REDUCTIONS**



levels of emissions. In many states, permits do not specify operating conditions, but only address technology requirements, or hourly rates. For this reason, permits specify only allowable limits and may not accurately describe actual emissions. As discussed earlier, only actual reductions can be certified in most cases.

Furthermore, in some situations a source may not be subject to a permit (e.g., a minor source or a source in a state without a permitting system), the terms of the permit may not specify a definite level of emissions that readily translates into an emission limitation (e.g., the permit specifies operating procedures, work practices, operation of equipment), or the permit may not reflect existing emissions at the time the SIP design value was calculated.

To determine the baseline in these situations, some form of engineering analysis, monitoring, or other form of audit is required. Because emission reductions must be real, permanent, and enforceable, the establishment of "before-and-after" baselines is an important function. Although the onus is clearly on the source to produce evidence documenting the creation of an emission reduction, the APCA must be able to "confirm" or verify this information. In situations where this is not possible, it may be necessary to deny a source's claim that it has created a certifiable emission reduction.

To determine actual annual operating hours, APCAs could ask sources to submit records, bills, and other documents which can substantiate the claim. Similarly, throughput on an annual basis can be estimated using engineering analyses. Establishment of a baseline will probably need to

Four steps are involved in the process of quantifying an emission reduction.

- (1) If the source is not operating under a permit, one must be issued. In some states, permits may not have been issued for all major sources, or the permits may not specify an exact emission standard for the source (e.g., it may specify a work practice, percent removal).

In these situations it is imperative for the APCA to establish a baseline of current emissions before determining the magnitude of emission reductions created by a source. For the source to engage in banking, it is essential that an operating permit be established based on the revised emission limits which result from creating and confirming an emission reduction.

- (2) The APCA must establish the baseline and confirm the magnitude and permanence of the reduction claimed. This key step should not require the APCA to perform elaborate monitoring and measurement activities. The burden for documentation should be placed on the applying source. The APCA should clearly specify what type of information and documentation will be required. If additional supporting evidence is necessary, the APCA should require the source to obtain it; or, where desirable, the APCA could perform the tests itself, but impose the

financial cost on the source. It is necessary, of course, that the APCA review the documentation received.

- (3) The source's emission reduction permit must be legally enforceable. The APCA quantifies the source's emission reductions and rewrites the permit to reflect a lower (by the amount of confirmed emission reductions) emissions level (or a new control requirement that assures actual reductions) for the source. This has the effect of legally binding the source to emit at or below this new level. The permit change also should reflect any additional requirements that the source must meet to assure the permanency of the emission reduction--for example, periodic measurements, continuous monitoring, submission of input data--to verify that the new lower baseline is not being exceeded.
- (4) The change must be made SIP enforceable. Under provisions of the Clean Air Act, all major sources must come under federally enforceable emission limits. This requirement is satisfied by the incorporation of source-specific emission limits or state operating permits as part of SIPs.

be done on a case-by-case basis in most instances. The burden of proof must be on the applicant to convincingly demonstrate and substantiate a baseline of actual emissions.

There are a variety of options which state agencies can use in developing baselines. For example, baseline levels could be defined as two-year averages of actual emissions. What is important is that agencies use consistent measurement or estimation techniques to determine baselines and emission reductions.

Estimates of the actual emission reduction achieved by particular kinds of control equipment are subject to wide margins of error. Because precision is not possible, alternative requirements must be used to assure that emission reductions are accurately measured. For example, parameter measures may be used to indirectly indicate the actual level of emissions.^{5/} Similarly, some emission reduction techniques are monitored rather than the emission reductions they are presumed to create. Such techniques would include changes in work practices, processes, and inputs. The reductions achieved by these techniques may not be subject to accurate measurement, but the techniques themselves are subject to precise verification.

The change in a permit or creation of a new permit for banking must be incorporated into the SIP to be legally enforceable under the Clean Air Act.

Sources will want to consult with the APCA before deciding to create emission reductions with the anticipation of converting them into ERCs. As noted earlier, a source contemplating efforts to create ERCs will want to obtain from the APCA an estimate of how much credit its efforts will produce. The changes in the source's permit and the SIP revision formalize what the APCA has confirmed. These formalities must be satisfied before the emission reduction qualifies for banking credit. The certification process will be discussed in the next component.

SUMMARY

Component 2 requires that the creating source notify the APCA and provide adequate documentation that a specific emission reduction has been or will be made. To insure the enforceability of the reduction, changes are

^{5/}For example, the reduction can be measured indirectly by gauging the temperature, pressure, or other physical characteristics of the process affected by the control equipment.

made in the source's permit and in the SIP. Only those emission reductions which are clearly identifiable, measurable, and certain will be confirmed and, hence, available for conversion to ERCs. The steps, again, are:

- (1) If the source is not operating under a permit, it must be brought under a permit reflecting the proposed emission reduction.
- (2) The APCA must officially establish the baseline and confirm the magnitude and permanence of the reduction claimed.
- (3) The source's permit must be changed to reflect reduced, actual emissions.
- (4) The SIP must be changed to reflect the permit change.

2.3 Component 3: Certifying Emission Reduction Credits

An accounting system is necessary to maintain order in the creation and use of ERCs. Specifically, such a system should:

- impede fraudulent use of ERCs;
- reduce carelessness in banking ERCs;
- facilitate the APCA's oversight of banking activities; and
- provide legal protection to owners of ERCs.

ERC certification should coincide with emission reduction permitting and SIP revisions in order to achieve maximum efficiency and accuracy. Administratively, it should be relatively easy to establish one set of books (i.e., a registry) which would include the information necessary to account for the creation and use of ERCs.

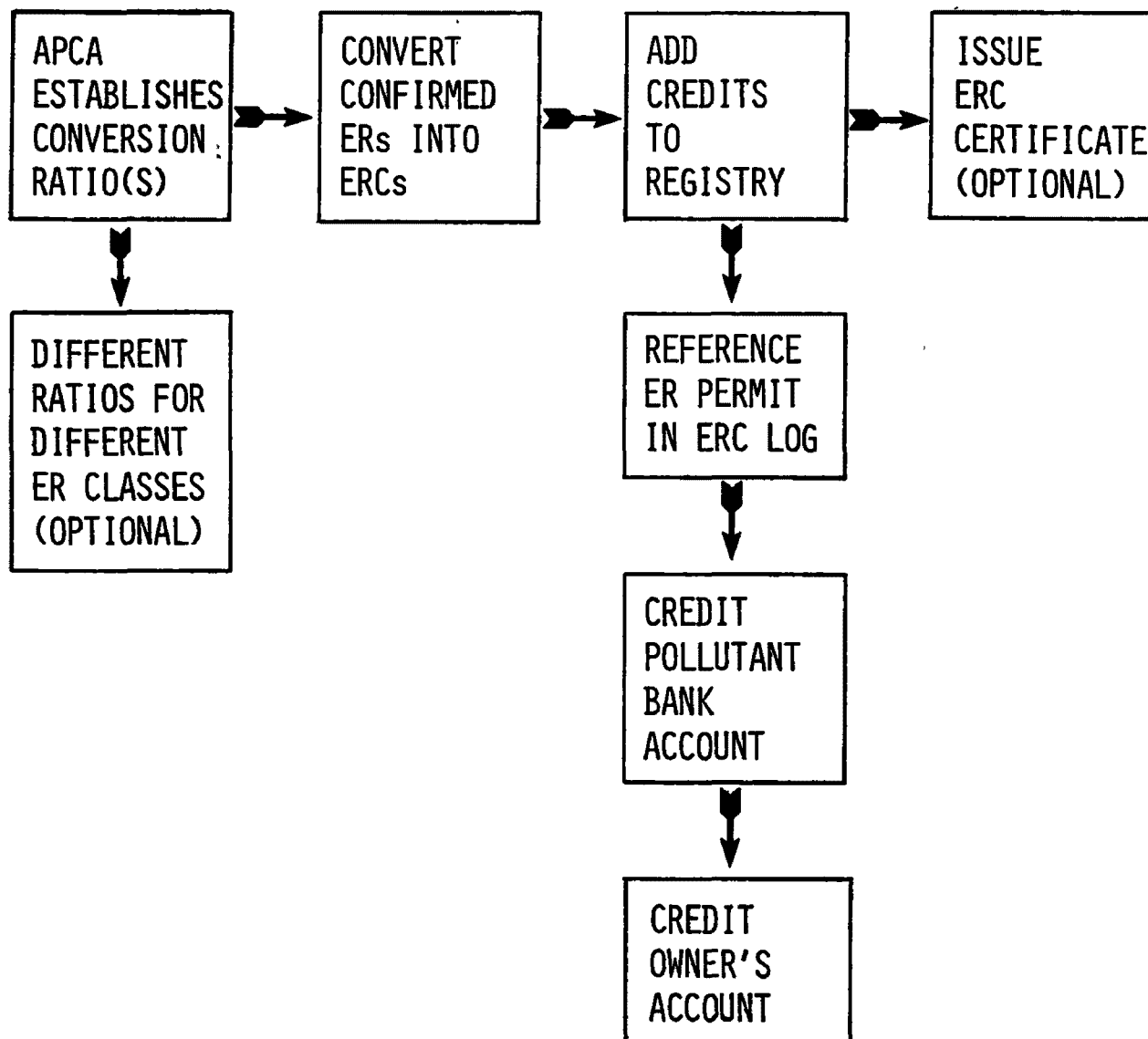
The process of certification is illustrated by Exhibit 10. The formal certification (or issuance) of ERCs requires an APCA to determine that the source and emission reduction are fully qualified to receive a number of ERCs. Once credits are issued they vest certain privileges in the owner and may receive limited protection in the event of a SIP change (see Component 4).

Sources are always free under the law to control their emissions more than required. However, no legal status attaches to those reductions. When the reductions are certified and converted into ERCs, sources are bound legally to emit a lower quantity of pollution. In exchange, sources receive an intangible though valuable asset--ERCs.

While valuable, an ERC is not a "right to pollute." It entitles the owner to certain

EXHIBIT 10

CERTIFYING EMISSION REDUCTION CREDITS



administrative privileges but does not circumvent the requirements for obtaining valid emission permits for using the public's air. To avoid misunderstanding, state agencies should make this distinction clear and explicit. For example, language in the certificate should state that the ownership of credits does not exempt a source from any permit requirements. Use of credits, however, can help a firm satisfy permit requirements.

One important rule needs to be emphasized: a grant of Emission Reduction Credits cannot be greater than the actual magnitude of the emissions reduced. However, reductions in actual emissions can be credited at less than one-for-one. If this is done, it must be on the basis of explicit rules that are applied in a consistent, rational manner. Thus different "conversion ratios" can be developed for various classes of emission reductions which reflect valid public policy concerns and measurement uncertainty. Alternatively, credits could be certified on a less than one-for-one basis for two other reasons:

(1) to accumulate publicly-owned ERCs to be used in accordance with public purposes, or

Options for Limiting the Life of ERCs

States are not required to certify ERCs as valid in perpetuity. Instead, states may specify a definite period within which ERCs must be used, traded or forfeited. This could be done in order to discourage hoarding or monopolization of ERCs. However, such a restriction may create perverse incentives and may discourage production of emission reductions.

(2) to help drive Reasonable Further Progress. In both of these instances, a less than one-for-one conversion ratio would be likely to severely discourage the production of voluntary emission reductions.

ERC Registry. A central registry must be established. Much like the way claims to land are registered, ERCs exist and belong to some entity when registered. This allows the tracking and accountability essential for banking (and trading) purposes. One set of books must be set up as the repository of information about the creation and use of ERCs. The APCA should maintain the registry. Use of an Emission Reduction Credits Register by an APCA will provide the most efficient mechanism of tracking and accounting for Emission Reduction Credits. The sample register presented in Exhibit 11 allows an APCA to track the certifying, banking, and use of ERCs. The sample register has three parts--a log for recording entries, a cumulative tally of banked ERCs by type of pollutant, and an "account" for each user of the banking program. Together, these three parts provide

pertinent management and control information about the banking program.

- **The ERC Log (Part 1).** The log is essentially a sequential summary of information relating to the certifying and cancelling (i.e., the use) of ERCs. The log permits the tracking of Emission Reduction Credits by referencing the permit which incorporates the creation of the emission reduction. The log summary also contains such information as the identity of the owner of the credits, the location of the source, the amount of the credits, the pollutant involved, and the source class (if any). Detailed information concerning the characteristics of the emission reduction is essential in order to evaluate future effects on air quality at the time the ERC is used. Emission levels for reductions should be given in tons/hour, tons/month, and tons/year and emissions during the month of highest ambient concentration should also be specified.

In addition to cross-referencing the permit which incorporates the confirmed emission reduction, the log also provides for the entry of subsequent information about the use of ERCs. Later entries documenting the use or adjustment of the ERC can be cross-referenced. This allows the APCA to reconstruct the entire chain of events surrounding the creation, banking and use of particular ERCs.

- **The Cumulative Tally (Part 2).** These tallies provide a cumulative overview of the amount of banked emissions for each pollutant. This account gets credited whenever an ERC is issued. Conversely, the account is debited whenever an ERC is used to provide an emissions allowance. The "Entry No." functions as a cross-reference back to the ERC Log and the information contained there.
- **The Individual Accounts (Part 3).** When an ERC certificate is first issued to a source, an account is opened in the owner's name. Subsequent ERCs are credited to that individual owner's account. If ERCs are used in permits, the owner's account must be debited. This part of the Registry allows the APCA to determine quickly whether a source owner has enough credits in its account to cover a proposed use (or sale) of ERCs.

Each time an ERC is certified an initial entry in the registry should be made. The actual entry requirements should present a relatively minor administrative burden. In addition, the APCA should provide the source with some documentation. Three kinds of

SAMPLE EMISSION REDUCTION CREDIT (ERC) REGISTER

Part 1: ERC Log

ENTRY No. ERC REGISTRY LOG

80-1 Certificate No. 80-1
 Issued to (owner) _____
 Source location (address) _____
 For (amount) _____
 Of (pollutant) _____
 Source Class _____
 Permit Ref. _____
 Certificate Ref. _____

80-2 Certificate No. 80-2
 Issued to (owner) _____
 Source location (address) _____
 For (amount) _____
 Of (pollutant) _____
 Source Class _____
 Permit Ref. _____
 Certificate Ref. _____

Part 2: Banked ERCs By Pollutant

ERC REGISTRY: (POLLUTANT)

ENTRY NO.	AMOUNT	TOTAL
80-1	+1000 tons	1000 tons
80-9	+1200 tons	2200 tons
80-10	+520 tons	2720 tons
80-15	-900 tons	1820 tons
81-2	+300 tons	2120 tons
81-11	-520 tons	1600 tons

Part 3: Banked ERCs By Owner

ERC REGISTRY: (OWNER)

ENTRY NO.	POLLUTANT	AMOUNT
80-1	VOC	+1000 tons
80-2	TSP	+817 tons
80-10	VOC	+520 tons
81-11	VOC	-520 tons

**An Emission Reduction Credit (ERC) Register Allows An APCA
 To Track And Account For The Certifying, Banking, And Use Of ERCs**

documentation are: (1) a letter that affirms the amount of ERCs created and mentions the possibility of future adjustment to that amount; (2) a copy (carbon or photostat) of the relevant registry page(s); and (3) an ERC certificate (see Exhibit 12).

Each time ERCs are used, a subsequent entry must be made. Again, it is absolutely essential that the central registry be kept up-to-date. Therefore, if ERCs are adjusted an entry should be made debiting the owner's account and noting the reason for the adjustment. Similarly, each time a source uses some of its ERCs, an entry should be made debiting the account to reflect the application of the ERC to a permit and its deletion from the account. Debit entries also should be confirmed by letter.

SUMMARY

To guard against possible misuse of the banking system, careful "tracking" of ERCs is necessary. The registry is analogous to the system of recording the ownership of real

forward. It applies to the holding period which begins after ERCs are certified and registered and ends when ERCs are extinguished by conversion into physical pollution allowances and applied to the conditions of a permit. The ERCs are banked until they are used--that is, converted into physical pollution allowances, at which time the ERCs are extinguished.

As ERCs are certified, traded, and used, the appropriate entries must be made in the registry. (See Exhibit 13.)

Any adjustments to ERCs must also be entered into the registry. This situation will not commonly occur, but it is a possibility. During the period after ERCs are certified and registered, and before they are used, an adjustment to reflect changes in the state's overall SIP or ambient air quality standards could be assessed against banked ERCs.

An issue of great importance to sources which might want to bank ERCs is the security

If trading of ERCs is to be fostered, it is essential to separate the validity of the ERC from the reduced enforceable emissions limit on the producing source. A good faith buyer should not be penalized if the producing source fails to satisfy its legal obligations.

estate and its transfer. A registration system for ERCs should be centrally compiled so that conflicts or discrepancies can be minimized or more easily located and resolved. For information purposes, duplicate sets could be placed in key locations throughout the banking region. Presence on the registry should be an invariable requirement for the use of an ERC. To recap, the four steps in this component are:

- (1) A central registry must be established including provisions for an ERC log, a cumulative tally of ERCs by pollutant, and the individual account of each owner.
- (2) A ratio for converting emission reductions into ERCs must be determined. (This generally will be 1.0.)
- (3) Each time an ERC is certified, an initial entry should be made.
- (4) Each time ERCs are used, a subsequent entry must be made.

2.4 Component 4: Banking and Accounting for Emission Reduction Credits

The actual "banking" or storage component of the system is quite simple and straight-

a new form of "entitlement" sources may have concerns that the credit could be revoked in whole or part under specific circumstances. To address this uncertainty, APCAs should spell out in their banking regulations the specific circumstances under which ERCs may be reduced. The following situations will be discussed here:

- What happens to ERCs if the reduced baseline on which they depend (e.g., on enforceable permit) is violated?
- What happens to ERCs if the SIP is changed in a direction of fewer allowable emissions?

Permit Violations and ERCs

ERCs, by virtue of being certified, are separate from the emission reductions that justified them. This means that ERCs generally should not be constrained or reduced if the creating source violates its (reduced) emission limits. Agencies must enforce those limits, of course. The violation should be treated like any other violation.

It may be possible to establish rules which penalize the producing source for violations. If the source still has possession of the ERCs in the bank, such a penalty could take the form of a reduction in the number of the ERCs. However, once ERCs are traded, the buyer must be protected against any diminution of its ERCs because of violations on the part of the seller.

EXHIBIT 12

SAMPLE EMISSION REDUCTION CREDIT CERTIFICATE

EMISSION REDUCTION CREDIT CERTIFICATE No. 80-__

Issued To: _____	Date : _____
Pollutant: _____	Permit _____
Amount : _____	Reference: _____
Register _____	Source _____
Entry No.: _____	Class & _____
	Location : _____

This certificate represents ownership of the above amount of emission reduction credits for the specified pollutant. The emission reduction was produced by (method of creation) and confirmed by (APCA). See Permit (permit reference no.). Subject to the rules established by (APCA) for emission reduction credit banking and use, these credits may be used to meet requirements for a new source permit or to comply with emissions limits required in the SIP. Use of some or all of these credits to satisfy permit requirements is subject to the approval of (APCA) according to its rules. All emission reduction credits are subject to pro rata adjustment in the event of changes in national ambient air quality standards or modification of the state implementation plan. No credits may be transferred without the express approval of (APCA).

(official signature)

(official signature)

For Official Use Only: Summary of Use History

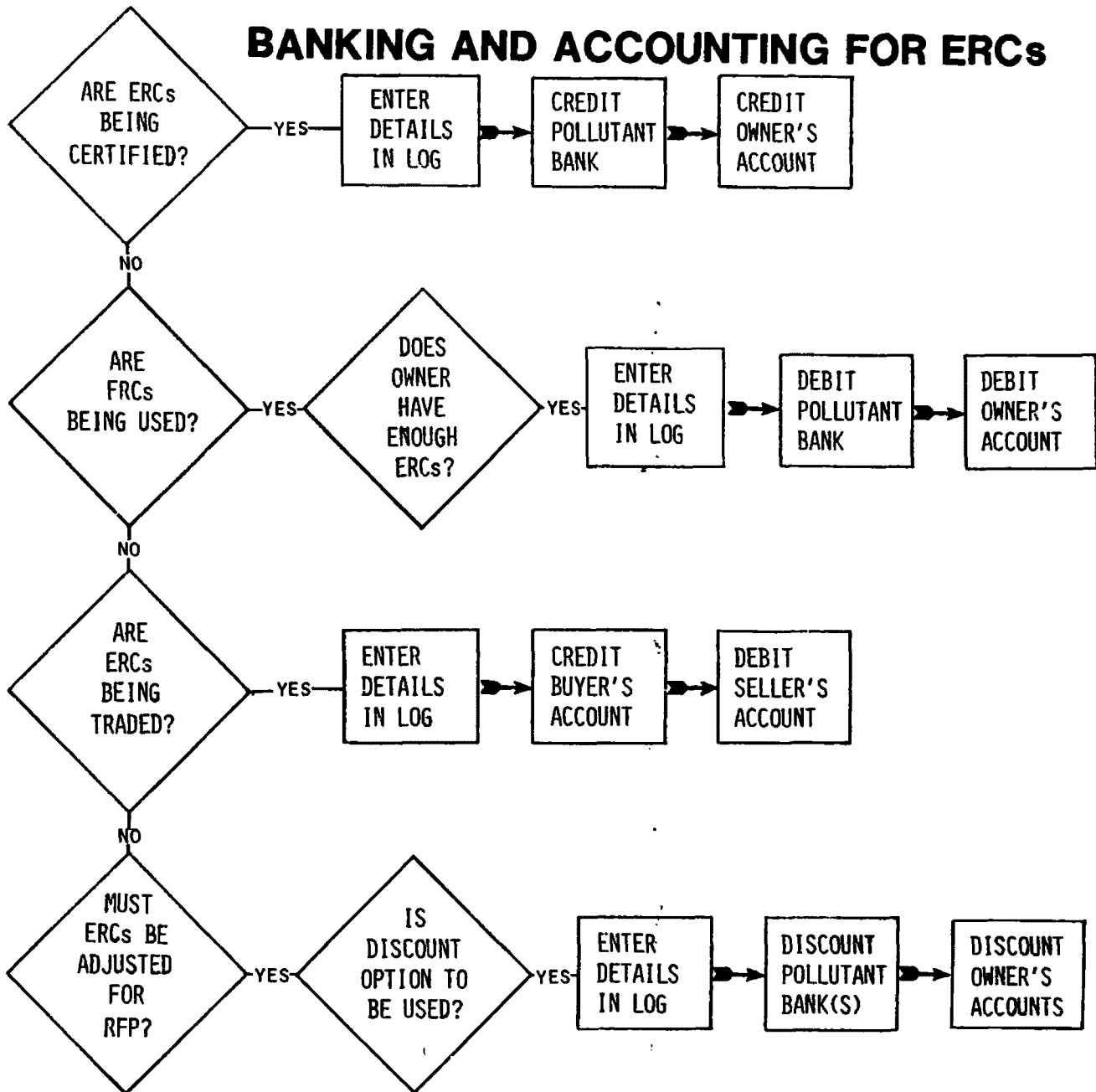
Certificate No. _____ withdrawn for use in Permit No. _____ .

Certificate No. _____ reissued for remaining credits. See Registry

Entry No. _____.

EXHIBIT 13

BANKING AND ACCOUNTING FOR ERCs



SIP Changes and ERCs

At some time during the existence of an ERC bank, it may be necessary to revise the SIP in order to satisfactorily demonstrate attainment or Reasonable Further Progress (RFP). It is important that banking rules address the issue of what can happen to banked ERCs if RFP is not maintained or if attainment is not accomplished as scheduled.

There are several options available:

- (1) a moratorium on use of ERCs until RFP is demonstrated;
- (2) increased ratios of ERCs needed to meet different SIP requirements;
- (3) ERCs may be discounted pro rata; and
- (4) all rights to ERCs may be forfeited.

One or more of these options must be addressed in the banking rules as a contingency in the event that RFP is violated or attainment cannot be demonstrated. As stated earlier, ERCs are not an absolute right to pollute. They are granted to sources which reduce emissions to the degree not already required to meet ambient air standards or RFP. If this assumption on which the ERCs were granted is not satisfied, the state must take corrective action.

For example, if there were a total of 500 ERCs banked and a SIP revision required a 10 percent reduction in emissions, every ERC would be reduced by 10 percent. Thus, if a source had 100 tons of ERCs, it would have 90 after the reduction; but those 90 would still represent 20 percent of the 450 total ERCs banked.

In demonstrating attainment, states must consider all banked ERCs. Even though they do not represent actual emissions, ERCs represent potential emissions that will affect air quality. They are like individual growth allowances, premised on the assumption that Clean Air Act standards will still be met if the ERCs are used. If the premise underlying the SIP proves false, ERCs are subject to the adjustments needed to restore the validity of the SIP.

Any of the above-listed options can be used to meet SIP requirements under the Clean Air Act. Each option has different strengths and weaknesses which are discussed next.

The discounting of banked ERCs offers a practicable way to accommodate SIP changes. Under this option, each block of ERCs in the bank is diminished to the same degree that uncontrolled emissions in the inventory must be reduced. The amount of discounting depends on the reductions required for all emissions of that pollutant, including those

banked, to satisfy RFP or attainment (e.g., a 10 percent discount). The banked ERCs would bear an equitable part of the burden for re-establishing RFP--existing sources also would be required to reduce emissions as part of the effort to meet the new SIP requirements. In addition, although the quantity of banked ERCs held by firms would be diminished, because air resources have become scarcer, their relative value would likely increase.

The moratorium on use of ERCs does not reduce the amount of ERCs granted. Thus, under this option, sources are guaranteed that the value (i.e., tons/year) of ERCs will not be diminished. In exchange for this, however, sources may be unable to use these ERCs until RFP has been demonstrated.

An alternative to a moratorium which also focuses on the use of ERCs is to increase allowance ratios. This means that, when RFP or attainment is in jeopardy, the APCA will require more ERCs to satisfy the same emission reduction requirement. Thus, in the context of offsets transactions, the ratio of new emissions to reductions in existing emissions may be increased significantly so as to drive RFP and attainment.

The wholesale forfeit of ERCs when a new SIP is developed would be an extremely unwise choice. The effects of such a rule would likely be devastating on banking programs. Any of the other options should be preferred to this one.

In conclusion, for most communities discounting appears to be the preferred alternative for accommodating banked ERCs to changes in SIPs.

SUMMARY

The process of accounting for ERCs requires the maintenance of a log and entries whenever an ERC is created, traded, or used. In addition, adjustments to ERCs may be entered as discounts if necessary to satisfy RFP.

An APCA has a number of options for dealing with ERCs should it be necessary to obtain additional reduction to satisfy the Reasonable Further Progress requirement. It could develop a discounting or adjustment procedure whereby the number of ERCs in the bank would be reduced by the same proportion as the amount of additional controls required from the emissions inventory.

For example, if 100 additional tons of control were required when 200 tons were banked and 800 tons were on the inventory, 80 tons of control would be assessed against current emissions and 20 tons against the banked ERCs.

It may increase the necessary trade-off rate. Alternatively, it may place a temporary moratorium on the use of banked ERCs until Reasonable Further Progress is again attained.

A fourth option--the confiscation of ERCs--is also possible, but would severely inhibit banking activity and undermine the potential benefits of the program. Whatever option is provided, it must be clearly stated in the banking rules.

2.5 Component 5: Using Banked Emission Reduction Credits

The final component of a banking system concerns the use of the banked ERCs. The APCA must establish both the administrative steps which will be required when a source seeks to use an ERC against a permit requirement and the appropriate regulatory contexts for the use of ERCs. The APCA's primary goal during this component is to establish procedures which:

- insure the integrity of the banking system;
- facilitate the use of banked ERCs;
- minimize the administrative burden; and
- insure the attainment and maintenance of ambient air quality.

It is extremely important that requirements placed on the use of ERCs do not create an undue burden on either the APCA or the source seeking to use its ERCs.

As discussed in Part 1, ERCs may be used as offsets, in bubble applications, or to satisfy PSD requirements.

It should be recognized that banking does not bring the complex task of determining the acceptability of using specific ERCs into the air pollution control system. It is already required for new source offsets and existing source bubbles. Banking may increase the demand for these determinations, which are now done on a case-by-case method. Agencies may then find it more efficient to develop basic guidelines or rules of thumb for use determinations. This could reduce workloads if the guidelines do an adequate job of estimating ambient air effects.

Specific Steps in Using Banked ERCs

There are three specific steps in using ERCs.

- (1) The source must propose the use of ERCs to the APCA. ERCs may be used by a source in several contexts:

- to satisfy an existing emission limitation (i.e., a bubble);
- to satisfy a recently instituted, more stringent emission requirement; and
- to satisfy an offset or PSD requirement for a planned new or expanded facility (i.e., new source review).

Regardless of the context, the responsibility of proposing that an ERC be used to satisfy a permit requirement clearly falls on the source. Each of these uses has its own specific requirements that must be satisfied.

- (2) The APCA must evaluate the proposed use. It is the responsibility of the APCA to review and rule on the particular use of ERCs proposed by a source. The agency should take several steps to minimize the administrative burden of evaluating these proposals. The use of ERCs will be limited to those situations in which: (1) the pollutant characteristics of the ERC and the proposed use are equivalent (e.g., same pollutant type and equivalent dispersion effects) and (2) the use must not interfere with the demonstration of attainment by the state. The burden for satisfying these requirements falls squarely on the source proposing the use. When the proposed use involves a facility different from the one at which the ERC was created, air quality modeling may be required at the discretion of the APCA. Nevertheless, APCAs are advised to include a fair and consistent decision rule in their banking regulation for determining sufficiency, rather than relying on a case-by-case assessment.

The APCA should publish review guidelines for ERC use. These guidelines should specify: (1) the contexts in which banked ERCs may be used; (2) limits based on pollutant characteristics; and (3) tests required of sources to demonstrate the effect on ambient air quality of using a banked ERC. These guidelines should allow a source in its early planning stages (i.e., before significant time and resources are expended) to determine whether an ERC could be used to partially satisfy a new source or permit requirement. In many instances, it might also be useful for the source and the APCA to hold a preliminary conference to discuss the likelihood that a proposed use will be acceptable and the specific tests required to gain approval. The process by which a source determines the eligibility of a proposed use of an ERC is illustrated in Exhibit 14.

- (3) The permit is issued and the SIP changed to reflect use of the ERCs. The APCA is responsible for maintaining accurate records of the creation and use of ERCs and also for insuring that ERCs are reflected in source permits and the SIP. The use of ERCs is similar to that of withdrawing funds from a bank account; at the time ERCs are used, they are extinguished from the ERC registry. To insure consistency with Clean Air Act requirements, the APCA must take the necessary steps to alter its SIP to reflect these changes.

EXHIBIT 14

PROCEDURE FOR REGULATING THE USE OF ERCs

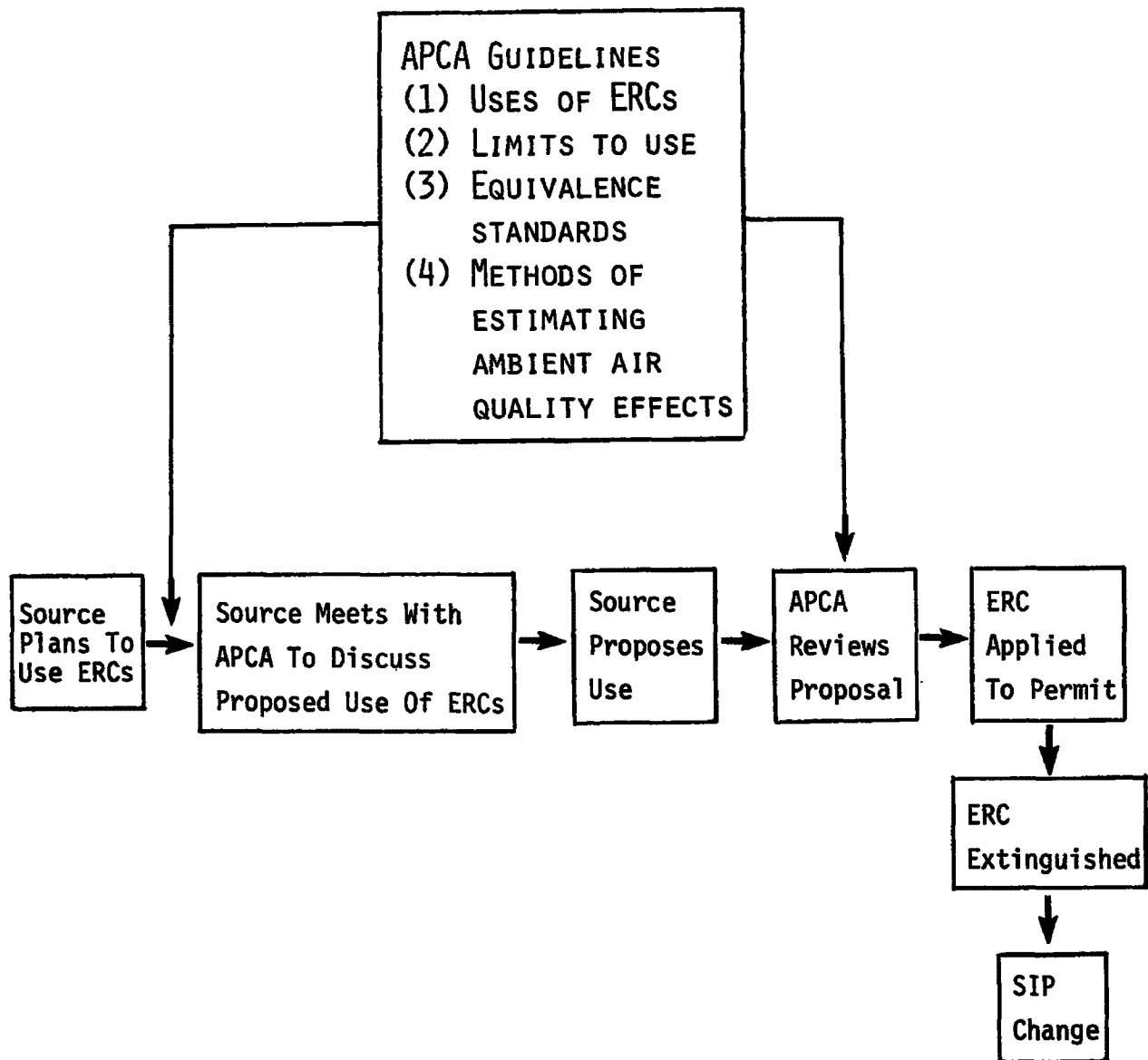


EXHIBIT 15

USE OF SUFFICIENCY TESTS

CRITERIA FOR SELECTING TEST

SIZE
 LOCATION
 POLLUTANT
 TYPE OF REDUCTION
 AMBIENT AIR PROBLEM

SAMPLE TYPE OF TESTS

Simple Ratios	1.1 to 1.0
Complex Ratios	1.1 within 5 kilometers 1.5 for longer distances
Simple Modeling	Limited to the two sources
Complex Modeling	All sources using a refined grid

SUMMARY

This final component, the use of the ERCs, involves three basic steps:

- (1) The source proposes to the APCA that ERCs be used to partially satisfy the requirements of a permit.
- (2) The APCA reviews the proposed use to make certain that the ERCs will be properly used, but should take steps to minimize the administrative burden associated with this activity.

- (3) The ERC is applied to the permit, the SIP is altered, and the ERC is extinguished from the ERC registry.

Possible contexts for which an ERC could be used include a more stringent emission limitation at the source site, an existing emission limitation (i.e., use of the bubble), a proposed expansion at the source site, and a proposed expansion involving offsets or PSD limitations.

PART 3: ADMINISTERING AN ERC BANKING SYSTEM

The success of an ERC banking program depends not only on good ideas and design, but also on good implementation and administration. The best rule will fail if poorly administered. Two things are necessary: (1) an explicit administrative process and (2) an administrative capability (staff, resources). Regulatory personnel and potential users of the program need to know how banking will be implemented, including the flow, timing, and criteria for technical decisions and appeals. Well-planned schedules, forms, and procedural charts will fulfill this need when coupled with good technical training and administrative skills.

This part of the manual describes the steps for setting up and operating a banking program. The administration of the banking program is closely allied with the program design discussed in Part 2. However, Part 3 deals exclusively with how best to implement and operate the program design selected.

3.1 Implementing an ERC Banking System

There are three major requirements for implementing a successful banking program: (1) legal requirements must be satisfied; (2) the foundation of the banking system must be established; and (3) a vigorous effort should be undertaken to encourage participation in the program. These requirements are summarized in Exhibit 15.

Developing a SIP Rule for Banking

There are three steps that must be taken to build a proper legal foundation for a banking system.

- A banking rule must be developed by the state or SIP designated locality.
- The SIP must be revised to include this new rule.
- The SIP revision must be approved by EPA.

A rule authorizing a banking program must be incorporated in the State Implementation Plan to form the legal basis for creating Emission Reduction Credits. This legal authorization must not be inconsistent with the Clean Air Act, and should address all foreseeable contingencies (e.g., a tightening of the SIP) so that rational investment decisions can be made. This rule could include or be supplemented by regulations to govern the creation, banking, and use of ERCs. It should specify eligibility and ownership qualifications and the protection that would be accorded banked ERCs in the event of a SIP

revision. The specification of the rules serve to enhance the certainty essential to firms considering investments in creating ERCs.

Many states authorized banking in their 1977 Part D (i.e., nonattainment) SIP revisions. Few of these states, however, provide the detailed program descriptions essential to a successful banking program. It will be necessary for most states to expand their banking rules and incorporate these revisions into the SIP.

In developing a detailed banking rule as part of their SIPs, states and areas with delegated SIP authority have a number of options. The banking rule could apply:

- to any area in the state developing a program;
- to only one or more specified areas in the state; or
- different rules could apply to different areas in the state.

To provide for consistency and prevent "jurisdiction shopping," states would be advised not to adopt the last alternative.

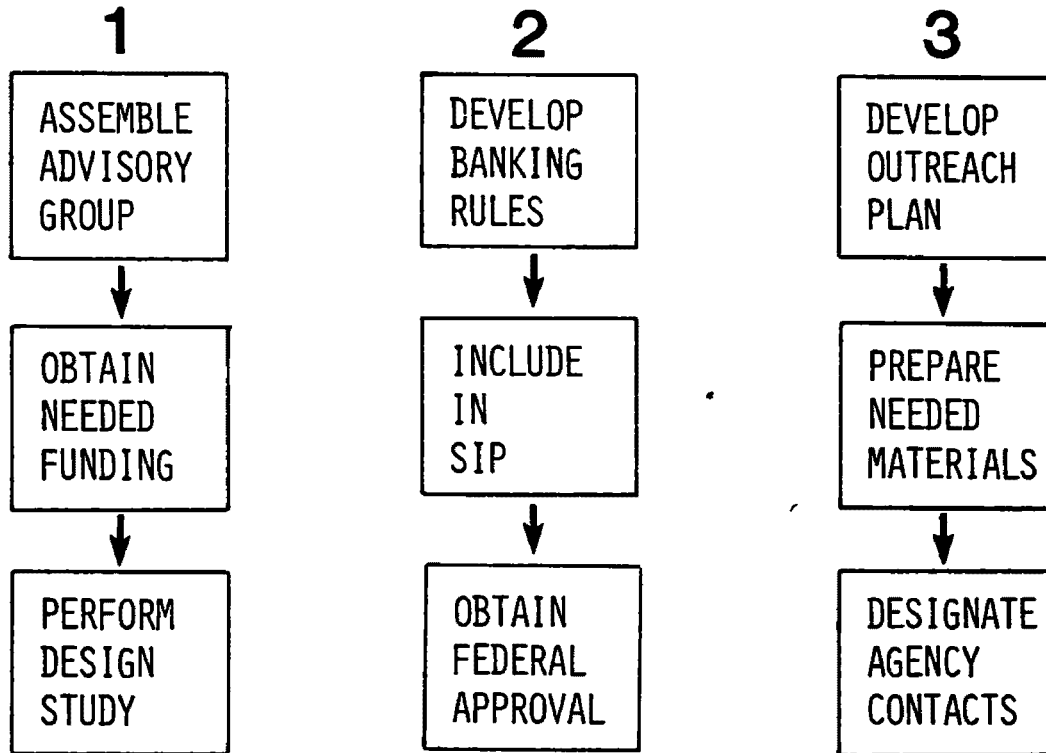
Establishing the Foundations of the Banking System

There are two steps that should be taken to establish the foundations of the banking system. These steps will affect the banking system rules and how the support for the system is structured.

- Assemble an advisory group to provide input in designing the banking system rules. The purpose of this step is to provide broad-based input to the rules which govern how an ERC may be created, who may create an ERC, and under what circumstances ERCs may be used. Organizations that should be represented in this advisory group include the regional air quality planning body, the council of governments or metropolitan planning organization, the state or local economic development agency, industry associations, and environmental groups. If a trading program is later initiated, it is likely that one of these organizations would be the sponsor.
- Obtain the necessary financing for implementing the banking system. Financing is needed primarily to fund the initial study of the system's design. This need not be an elaborate

EXHIBIT 16

IMPLEMENTING AN ERC BANKING PROGRAM



analysis quantifying the benefits of banking to a community. Instead, it should focus on assessment of the area needs and select among the number of optional elements of the banking system described in this manual. Support for the actual operations of the system should rely exclusively on user fees assessed against sources seeking to bank and use Emission Reduction Credits.

An elaborate study *will not* produce a good system. Involving all affected parties *early* in the design process and compromising to meet all needs will.

Supporting the Banking System

A good rule and good administrative procedures are necessary but not sufficient conditions for a successful banking program. Firms need to be informed of the opportunities of banking and may require assistance in order to use the banking system.

As its primary marketing tool, the air pollution control agency or cosponsoring organization (e.g., COG, business associa-

tion) should develop an information packet to send to firms that lays out a step-by-step flow chart, along with checklists, example forms, and other pertinent information describing how the system operates. Expected processing times for each of the administrative steps should be estimated, along with a list of contact personnel in the agency who can provide further information. The APCA itself should develop a flow chart of steps, personnel responsibilities, and tracking systems to keep applications moving in an orderly and timely fashion.

3.2 Operating an ERC Banking System

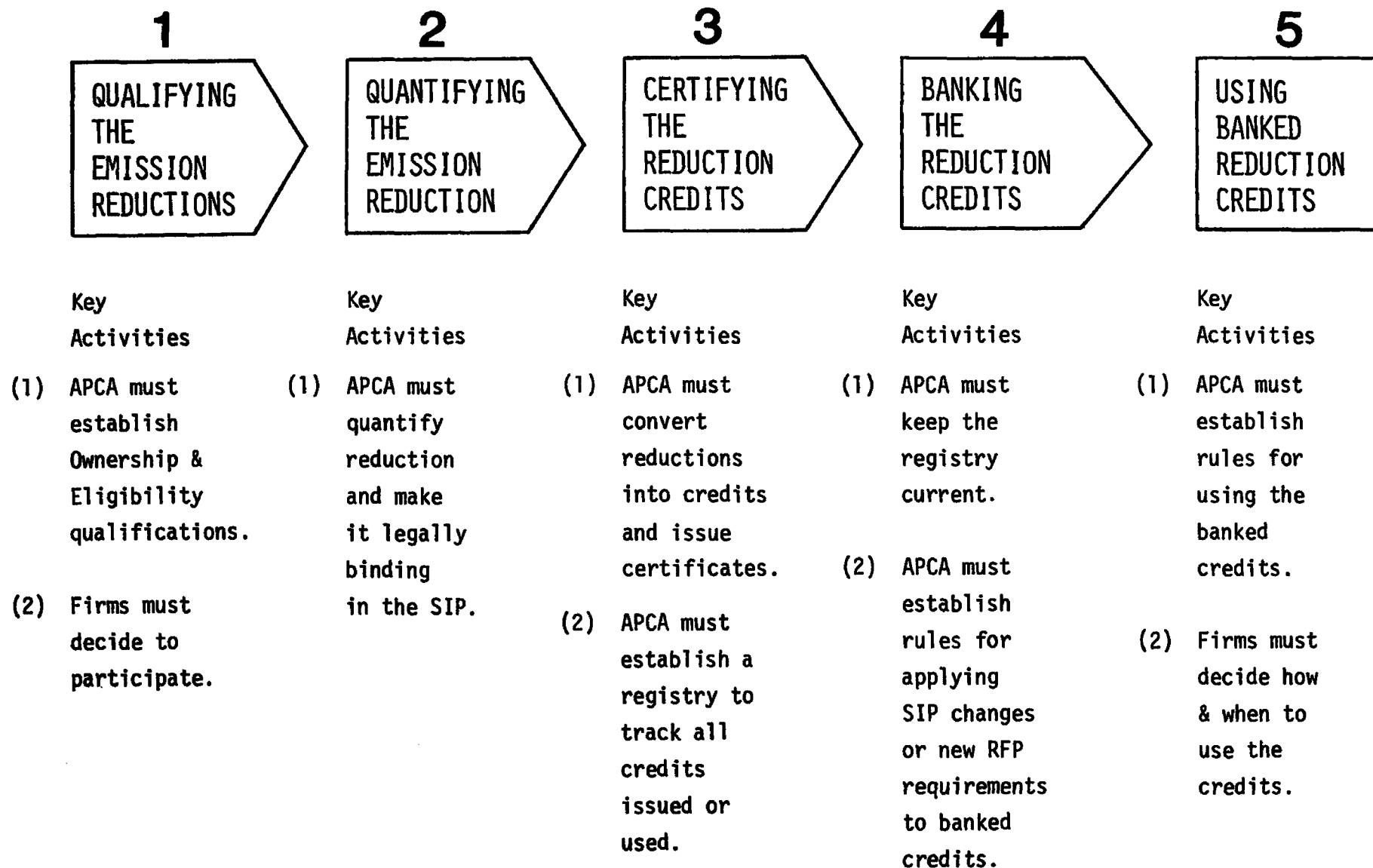
There are three major requirements for successfully operating an ERC banking system: (1) effective administration of the system; (2) technical assistance to current and potential participants, and; (3) feedback from participants about ways the banking system can be improved.

Effective Administration of the System

The interrelation of the five components of the banking system make the administration of each component important to the others. An administrative system should be defined for each component to insure that the banking

EXHIBIT 17

THE FIVE COMPONENTS OF THE BANKING SYSTEM



system as a whole will operate effectively. Exhibit 16 summarizes the administrative tasks facing the agency in operating a banking program.

1. Qualifying Emission Reductions. There are several steps the APCA performs in administering this component. These require the APCA to establish rules about how an acceptable emission reduction can be created and who may create emission reductions that will be eligible for certification as ERCs.

The APCA must go through a rule-making procedure that will provide notice of the proposed rules to affected parties and will give them an opportunity to comment. When the rules are in final form, copies should be sent to all interested parties and should be included as part of any marketing efforts. The appropriate qualifications for participating in banking should be clearly stated in the banking rules.

In summary, the first component's administrative structure should include the following:

- (1) plans to disseminate proposed banking rules including provisions regarding qualifications;
- (2) schedule of hearings to receive comments on proposed rules; and
- (3) plans to disseminate final rules.

2. Confirming Emission Reductions. There are six steps which the APCA performs in administering this component. These steps involve responding to requests from sources and quantifying the emission reductions for conversion into ERCs.

The source, if it is not operating under a permit, must establish an existing baseline of actual emissions against which emission reductions may be measured.

The next step involves providing sources with an estimate of what amount of emission reductions will be confirmed. This estimate must be made by the staff of the APCA, but should, where possible, be calculated using rules of thumb.

After creating an emission reduction, a source must notify the APCA to apply for ERCs. This notification should be made on a form containing information such as ownership, location, type of pollutant, how the emission reduction was created, and the estimated amount of emission reduction created. After the source has taken the initiative and contacted the APCA, the APCA should use its expertise, through its staff members, to confirm the magnitude and permanence of the emission reduction (the source would be notified of the documentation it would have to provide).

The reduction would be made enforceable by altering the source's permit and seeking incorporation of the permit change into the

SIP. The SIP change is not something the source applicant can effect unilaterally. The source, however, is responsible for providing the necessary documentation to state and EPA officials.

In summary, the second component's administrative structure should include the following:

- (1) procedures for determining an emissions baseline, including a form which can be used by a source to request an operating permit from the APCA;
- (2) procedures for individual sources to request and obtain an estimate of the ERCs to be granted as the result of a proposed emission control action;
- (3) a form by which a source can notify the APCA that an emission reduction has been created;
- (4) procedures for officially confirming the magnitude and permanence of the emission reduction, including guidelines about what information and documentation should be provided by the source;
- (5) procedures for changing a permit to reflect the emission reduction created by the source; and
- (6) guidelines including what documentation is necessary, for seeking a SIP change.

3. Certifying Emission Reduction Credits. Three steps must be taken by the APCA in administering this component. All are related to an accounting and recording procedure which is designed to provide the official record of ERCs created, banked, and used. The APCA must establish a central registry as the official repository of this information. (See Part 2.3 for greater detail).

In limited cases the APCA may want to apply a ratio to convert emission reductions into ERCs. When used, this ratio must not be arbitrary and should be based on criteria relating to the accuracy of the estimate and the kind, source, and pollutant class of the emission reduction created. The ratio should be determined on the basis of such concerns as the uncertainty in measurement and the effect of geographical characteristics on ambient air quality.

The primary action in this step is the certification and registration of ERCs to the account of the producing source.

In summary, the third component's administrative structure should include the following:

- (1) the APCA must establish a central registry to serve as the official record of ERC creation (and use);

- (2) if applicable, an appropriate conversion ratio should be developed and applied for classes of emission reductions; and
- (3) the ERCs must be entered into the central registry.

4. Banking the ERCs. Banking begins when the ERC is registered and continues until it is withdrawn and used. During this period, some events may occur which require certain adjustments to be made in the quantity of ERCs registered. These adjustments generally will be on a pro rata basis and can be made with little difficulty. The only administrative requirements are that the registry be maintained on a continuing basis and that someone enter any pro rata adjustments which may occur. If trading is allowed, ownership changes must also be entered in the registry.

In summary, the fourth component's administrative structure will include:

- (1) continual maintenance of the central registry, to account for all ERCs; and
- (2) specific responsibilities assigned to the designated registrar to enter adjustments in the registry as needed to satisfy RFP or a new SIP.

5. Using the ERCs. The APCA is responsible for administering five aspects of this component. The APCA must provide ERC holders with guidelines about the use (when, how, where, by whom) of ERCs. These guidelines should be promulgated as formal rules by which the APCA is bound. The APCA must provide a convenient means for ERC holders to notify the APCA of their proposed use of the credits. As in the second component, a form can be devised precisely for this purpose. The APCA should have some internal procedures established for evaluating the proposed use in light of the established rules.

The appropriate permit change must be made and debits entered into the central registry when the APCA approves the proposed provision. Finally, the SIP must be revised to reflect the changed permit.

In summary, the fifth component's administrative structure should include:

- (1) regulations regarding the use of ERCs should be incorporated into the original banking rule and the SIP;
- (2) a form to be used by ERC holders when notifying the APCA of a proposed use;
- (3) internal APCA procedures for accommodating proposed uses with the established rules;
- (4) procedures for making permit changes; and
- (5) processing of SIP revision.

This administrative framework, based on the five components of the ERC banking system, is

illustrated in Exhibit 16. Administrative effectiveness is necessary in operating the banking system, but the provision of technical assistance also helps assure its success.

3.3 Technical Assistance to Users of the Banking System

The lack of familiarity with the banking system on the part of most potential participants will require widespread technical assistance as soon as the banking system has been introduced. Presumably, as the banking system is used and experience in its operation grows, less technical assistance will be necessary. However, there always will be individual users who need to solve a unique problem or who have not been reached by initial educational efforts. Some examples of technical assistance include:

- Helping sources obtain the necessary funding. The APCA may want to provide potential buyers and sellers with written guidance about opportunities for financing the production of ERCs. EPA currently is developing financing manuals which can be used for this purpose.
- Informing sources of methods of producing ERCs. The APCA could make general information available to sources explaining different methods of producing ERCs.

There will be many particular issues that could confuse a potential user of the banking system. To the extent that the APCA is prepared to help resolve this confusion, the banking system's potential for success is enhanced.

Feedback From Participants

Administrative systems usually can be improved if experience under the system is frequently reviewed to correct previously undetected shortcomings. During the design and implementation stage, it is difficult to anticipate every need which the banking system should address or to identify errors made in the planning and implementation stages. For this reason, the APCA should develop a feedback or review mechanism and make it an integral part of the banking system. This mechanism does not have to involve an elaborate evaluation of the banking system. Instead, it should answer two basic questions:

- (1) Is the banking system meeting the needs of those who have used the system?
- (2) Has the banking system met the goals for which it was established?

In part 1.3, several reasons for establishing a banking system were suggested. During the review process, it should be useful to make

specific inquiries whether these advantages have been realized in practice:

- Has banking provided the APCA with greater flexibility in developing and implementing a SIP?
- Has banking provided the APCA a means to promote economic growth without impairing environmental quality?
- Has banking proved to be an incentive for firms to reduce emissions below the required level?
- Has banking encouraged innovation in air pollution control technology?
- Have firms found banking useful in their planning efforts?
- Has banking enabled firms to minimize the cost of complying with emission standards?

These questions suggest a two-tiered feedback mechanism: the appraisal of sources who have used or considered using the banking system and the appraisal of involved APCA staff. It is not necessary that the questions all be answered favorably; the exercise is supposed to pinpoint where the system is not performing as expected. When the malfunctions are identified, remedial measures can be taken.

For purposes of illustration, one approach to providing feedback is outlined below.

- Input from users or potential users of the banking system could be sought at two different points in time.
 - (1) Immediately after a banking transaction has been completed, the source involved could be given the opportunity to suggest changes in the banking process. This input can be standardized by development of a form soliciting suggestions and asking specific questions.
 - (2) On a regular basis (for example, semi-annually), an advisory panel of source representatives could be convened to provide input about the effectiveness of the banking system. Membership can be on a rotating basis, but some members of the panel should be from sources which have had recent experience with the banking system.
- Internal review by APCA staff should be an ongoing process.
 - (1) A staffer should be designated to handle the input from users of the system. This would coordinate the individual and collective inputs from sources.
 - (2) A regular review session (quarterly or semi-annually) should be conducted with input from all relevant

APCA staff. The overall performance of the banking system should be assessed, problem areas identified, and changes proposed.

Regardless of how it is structured, some review mechanism should be established so that the banking system can be kept responsive to the goals for which it was designed.

3.4 The Relationship of Banking to Trading

This manual has presented the components of banking, a process by which firms creating surplus emission reductions can "bank" them for later use to satisfy permit requirements. The focus of the manual has intentionally been limited to the banking of Emission Reduction Credits. At the same time, the proposed banking system has been constructed in a manner which facilitates the trading or transfer of ERCs between different legal entities.

The only significant difference between a system which allows for banking and a system which allows both banking and trading of ERCs is that the latter entails a comprehensive program for encouraging the sale of ERCs between sources.

Exhibit 17 illustrates the additional step required to allow trading. Following the certifying, registering, and banking of ERCs, a firm possessing ERCs would be permitted to sell these to another legal entity. This transfer of ownership could occur directly through a private sale, or through some form of public auction. The APCA could directly control the trading or simply be responsible for establishing trading rules and performing an oversight function.

For a thorough discussion of the mechanics of designing and implementing a trading system, the reader is referred to a brochure that explains trading in greater detail and to three separate manuals available from the EPA Banking and Trading Project. Each of these manuals explains a distinct trading system--a private trading system using brokers, a public auction system, and a central trading system. (See Appendix B.)

In designing its banking system, the APCA should not overlook the potentially significant benefits of extending the system to include trading. A system which includes both banking and trading offers several additional advantages:

- The Achievement of Environmental Quality at Lower Total Cost: Firms would be able to purchase Emission Reduction Credits from other firms in situations where the costs are less expensive than creating their own ERCs.
- The Establishing of a More Robust Market for ERCs: By allowing firms to sell their ERCs, a market for ERCs should be created. More buyers and

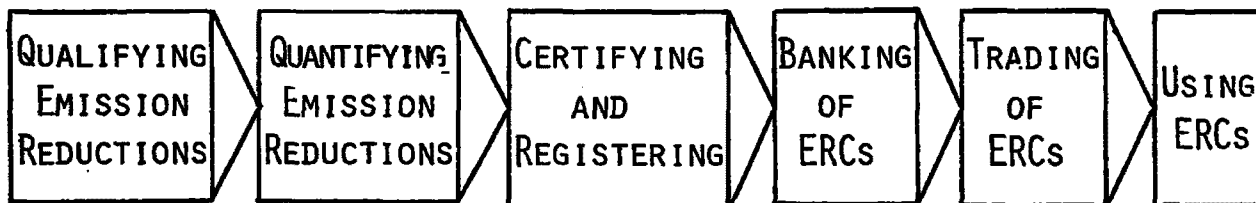
sellers should mean increased price competition and less delay and uncertainty in obtaining ERCs.

- Permit New Firms to Enter a Market: Firms not currently located in an area may be required to purchase offsets to satisfy nonattainment or PSD requirements. The availability of ERCs for purchase should facilitate their entry into a region.

Because of the advantages of trading, it behooves the APCA to work with other groups in their areas and to move forward as quickly as possible to extend banking to include the development of a system for trading of ERCs. Economic development agencies, regional planning organizations, and industry associations are examples of groups likely to take the lead in organizing a trading program.

EXHIBIT 18

EXPANDING A BANKING SYSTEM TO INCLUDE TRADING



**MANUALS DESCRIBING ALTERNATIVE TRADING SYSTEMS
ARE AVAILABLE FROM THE EPA.**

APPENDIX A: Glossary

Key terms, as used in this manual, are defined below.

- **Actual Emissions:** The level of pollution emitted by a source. Actual emissions may differ from "allowable" emissions, which is the level specified in a source's permit or in the State Implementation Plan (SIP). Whether allowable or actual emissions is used in determining the baseline against which emissions reductions are measured will depend on the manner in which the SIP was developed (see Exhibits 6 and 7 and accompanying text). In almost every state, actuals will form the baseline for measuring emission reductions.
- **Air Pollution Control Authority (APCA).** The public agency at the state and/or local level which has primary responsibility for implementing the Clean Air Act. The APCA is the most likely institution to implement a banking system--this manual reflects that assumption. It is possible however for a distinct body, e.g., the Chamber of Commerce, air quality planning organization, or an economic development agency, to develop a banking program, but only with the close cooperation and support of the APCA which will be responsible for implementing the program.
- **Allowable Emissions.** The level of emissions permitted by the terms of a source's permit or in the SIP. The question is whether allowable emissions is the appropriate baseline for measuring emission reductions. Only if current (i.e., actual) emissions are less than allowable emissions and the State Implementation Plan was designed using the emission levels specified in permits, would a source be allowed credit for this difference.
- **Allowance Ratio.** This ratio is applied during the process by which banked ERCs are converted for use to partially satisfy the terms of a permit requirement. The allowance ratio is a reduction in the quantity of ERCs to satisfy ambient air quality requirements.
- **Bank.** The term and its derivatives are used in three different senses in this manual. The term is not used to describe an institution where deposits, withdrawals, and other transactions are consummated. Therefore, there is not any one institution which can be described as the Emission Reduction Credit "bank". The three uses are:
 - (1) Banking is used to describe the process by which a firm initially reduces its emissions and applies for ERCs. The banking process continues until ERCs are extinguished through use.
 - (2) **Banked** refers to the status of an ERC after it has been certified, but before it has been used.
 - (3) **Bank** refers to the pool of ERCs currently entered in the central registry.
- **Baseline.** The level of emissions below which a source must reduce its emissions in order to constitute an "emission reduction." Generally, it is the more stringent requirement of actual or allowable emissions. But this will depend on how the State Implementation Plan was developed and the specific policy of that locale in satisfying the requirements of the Clean Air Act.
- **Bubble.** EPA's alternative emission reduction option which, when incorporated into a State Implementation Plan, allows a source to reduce control requirements at one point by increasing controls correspondingly at another. The bubble can be applied both within a single plant and between different plants in the same area. The policy is explained in detail in the Federal Register, Vol. 44, p. 71780 (Dec. 11, 1979).
- **Certificate.** The air pollution control agency issues certificates representing ownership of specific ERCs which appear on the register and thus are banked. These certificates are for recordkeeping purposes and are not legally transferrable.
- **Confirmation.** Air pollution control agency's verification given to a source's creation of an emission reduction. Confirmation is the second component of the banking process and comes only after all questions about the emission reduction (i.e., quantity, permanence, how created, etc.) have been resolved. A confirmed reduction in emissions would result in a change in the terms of a source's permit.
- **Controls.** The means by which an emission reduction is achieved. Generally this would be used in reference to the technological controls installed by a source--scrubbers, electrostatic precipitators, or other abatement equipment. However, it includes any measure taken to create emission reductions--shutdowns, cutbacks, altered work practices, alteration of inputs or production processes, etc.
- **Conversion Ratio.** The ratio is applicable to the process whereby an emission reduction is converted to an emission reduction credit (ERC). It is the fraction or percentage used to determine the number of ERCs which will be credited to an account. The ratio will generally be 1.0, and is determined after considering many factors

including any classification schemes applied to sources and pollutants, the characteristics of the ER, measurement certainty, etc.

- Emission Offset. A regulatory device designed to allow economic growth in an area where a national ambient air quality standard (NAAQS) has not been attained. The actual offset is obtained by securing a decrease in an existing source's emissions to compensate for emissions of a new or expanding source seeking to locate in a nonattainment area (see Section 173 of the Clean Air Act.)
- Emission Reductions (ERs). The physical reduction of emissions by a source. To be eligible for conversion into ERCs, this reduction must be below the measurable baseline or currently required level of emissions and must be permanently enforceable.
- Emission Reduction Credits (ERCs). The commodity which is "banked" and can later be used by a source to satisfy the required emission limits contained in its permit. The ERC is the end product of the conversion of emission reductions. ERCs are used by being converted back into physical pollution units using an allowance ratio in a manner consistent with other requirements (e.g., new or expanding source emission offsets, bubble). It is crucial that the distinction between emission reductions and ERCs be maintained--they are not synonymous.
- Minor Source. A subcategory of sources with emissions below some threshold defined by states in their SIPs (e.g., 25 tons per year). This subcategory of existing sources is typically excluded from permit requirements, and thus lack a baseline against which emission reductions can be ascertained.
- Monitoring. The measurement and recordation of emissions which occurs over time. The purpose of monitoring is both to obtain a measurement and to ensure the permanency of the emission reduction. Monitoring can involve in-stack devices which measure emissions or devices which measure input or output parameters.
- Nonattainment Area. A geographic area designated by EPA to be in violation of national ambient air quality standard (NAAQS). A major new or expanding source seeking to locate in a nonattainment area must arrange for sufficient offsets to insure that Reasonable Further Progress toward attainment of NAAQS is achieved.
- Nonconventional Sources. A subcategory of sources characterized by emissions which are not directly measurable. Nonconventional sources include roads, storage piles, and the like. Because of this characteristic, these sources are generally not subject to permits and an APCA may decide to exclude them from the banking system.
- Permit. The emission restrictions placed by the Air Pollution Control Authority on a specific source. The permit may specify a specific emission limit, require a percent removal of a pollutant, or dictate a particular work practice. Where possible, the permit conditions should be used as the baseline for evaluating emission reduction. The permit terms are also generally related to the SIP and thus any change in a permit requires a corresponding change in the SIP.
- Reasonable Further Progress or RFP. The requirement under the Clean Air Act that areas designated nonattainment achieve annual incremental steps toward satisfying ambient air quality standards by the designated deadlines.
- Registry. The books in which the banking system's activities are recorded and which serve as the accounting record for the issuance and use of ERCs. In a banking system, these books generally will be maintained by the APCA. They clarify ownership issues and facilitate the search process for needed reductions.
- Source. A source is any building, structure, facility, or installation which emits any air pollutant. A source may include several specific emitting points, but is limited to those owned by a single legal entity.
- State Implementation Plan (SIP). The legal mechanism, subject to EPA approval, by which a state proposes to achieve and maintain the ambient air quality requirements of the Clean Air Act.
- Trade. The transfer or sale of ERCs from one legal entity to another in some kind of market situation subject to APCA review and approval. Companion manuals deal with the potential for trading ERCs and how such a system complements the banking system.
- User Fee. Charges levied against sources that make use of the banking system. The charges can be used to defray operating expenses or to fully fund the operation of the banking program.

APPENDIX B: Selected Annotated Bibliography

The following titles, along with a more extensive annotated bibliography are available by mailing in the enclosed form or by contacting directly:

Emission Reduction Banking and Trading Project
U.S. Environmental Protection Agency (PM-220)
401 M Street, S.W.
Washington, D.C. 20460

AA001 Emission Reduction Banking and Trading Project, Office of Planning and Evaluation, U.S. Environmental Protection Agency. Annotated Bibliography.

A complete listing and explanation of publications dealing with banking, the bubble, and other economic incentives to control air pollution.

BA120 Hoffman, John S. Economic Advantages of Emission Banking Systems. Prepared for the U.S. Environmental Protection Agency.

Examines why emission reduction banking and trading systems save firms money, and offers a few design options available to states and localities in developing cost-effective systems.

BA200 ICF Incorporated. Emission Reduction Banking & Trading: Concept Paper. Prepared for the Emission Reduction Banking and Trading Project, Office of Planning and Evaluation, the U.S. Environmental Protection Agency, January 1, 1980.

An excellent introduction and overview of banking and trading. Divided into three parts, the first section of this paper generally discusses the concepts of banking and trading, their key terms, and analogies and precedents. The second part describes in detail the five stages of an emissions reduction, banking and trading system. The final part discusses the advantages and disadvantages of three trading systems: public auction, central trading system, and private trading.

BG250 ICF Incorporated. An Introduction to Trading. Prepared for the Emission Reduction Banking and Trading Project, Office of Planning and Evaluation, U.S. Environmental Protection Agency, October 1980.

This document presents a detailed discussion of the role of trading in a banking system. It explains the many advantages of trading and summarizes and compares the alternative designs for trading systems.

BG300 ICF Incorporated. Public Auction Trading System Manual. Prepared for the Emission Reduction Banking and Trading Project Office, Office of Planning and Evaluation, U.S. Environmental Protection Agency, October 1980.

BG400 ICF Incorporated. Central Price Trading System Manual. Prepared for the Emission Reduction Banking and Trading Project Office, Office of Planning and Evaluation, U.S. Environmental Protection Agency.

BG500 ICF Incorporated. Private/Brokerage Trading System Manual. Prepared for the Emission Reduction and Trading Project Office, Office of Planning and Evaluation, U.S. Environmental Protection Agency.

These three trading manuals explain the specific steps required to design and operate a trading system. They discuss the many design options, financing considerations, and institutional concerns in developing a trading program.

BG600 Emission Reduction Banking and Trading Project, Office of Planning and Evaluation, U.S. Environmental Protection Agency. Issues Paper on Shutdowns.

This issues paper discusses the options available to states and localities in treating emission reductions from shutdowns. It explores the legal, economic, and policy implications of these alternatives.

BA700 Emission Reduction Banking and Trading Project, Office of Planning and Evaluation, U.S. Environmental Protection Agency. Model Banking Rule.

This model rule illustrates and explains specific provisions that can be included as part of a banking system. Examples of banking rules already adopted by communities are included.

AH100 Public Financing Manual for the Creation and Purchase of Emission Reduction Credits. Prepared by Economic Analysis Division, Office of Planning and Evaluation, U.S. Environmental Protection Agency.

Firms and communities investigating available public options for financing the creation and purchase of emission reductions will find this manual especially useful. For each option, the manual discusses the following program issues and requirements: objective, funding level, form of funding, eligibility requirements, eligible activities, the range and average level of financial assistance, the funding cycle, and examples of previously funded activities. The manual also includes a brief framework for evaluating the individual options.

AH110 Putnam, Hayes & Bartlett, Inc. Private Financing Manual for the Creation and Purchase of Emission Reduction Credits. Prepared by Economic Analysis Division, Office of Planning and Evaluation, U.S. Environmental Protection Agency.

Some of the feasible private alternatives this manual identifies for financing emission reductions are stock options, limited partnerships, bank loans, stock, leveraged leasing, pollution control revenue bonds, and debentures. The manual catalogs these options by sources of funds, financing costs, qualifying requirements, management restrictions, legal and political implications, historical uses of the financing option, and option execution procedures. It also presents criteria for evaluating the options.

BANKING AND TRADING ORDER BLANK

Send to:

**Emission Reduction Banking & Trading Project
U.S. Environmental Protection Agency (PM-220)
401 M Street, S.W.
Washington, D.C. 20460**

Name _____

Address _____

Phone _____ Occupation _____

____ AA001 Annotated Bibliography
____ BA120 Economic Advantages Paper
____ BA200 Banking and Trading Concept
Paper
____ BA600 Issues Paper on Shutdowns
____ BA700 Model Banking Rule

____ BA250 An Introduction to Trading
____ BA300 Public Auction Trading System
Manual
____ BA400 Central Trading System Manual
____ BA500 Private/Brokerage Trading
System Manual
____ AH100 Public Financing Manual
____ AH110 Private Financing Manual

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