



68-01-6425

OPERATOR'S REFERENCE MANUAL

**FINANCIAL RESPONSIBILITY FOR WELL
PLUGGING AND ABANDONMENT**

SUBMITTED TO
DR. JENTAI YANG
OFFICE OF DRINKING WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY

MARCH 1983

BOOZ-ALLEN & HAMILTON, INC.
UNDER THE DIRECTION OF
GERAGHTY & MILLER, INC.



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I. INTRODUCTION TO THE MANUAL

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The Underground Injection Control (UIC) Program, established under the Safe Drinking Water Act places a variety of regulatory requirements on owners and operators of injection wells. One of these requirements is that a well be properly plugged and abandoned at the end of its useful life. To ensure that well owners and operators will be financially capable of meeting this obligation, the regulations direct the Program Director* to require permittees to provide evidence of available assets ("financial responsibility").

Several options are open to injection well owners and operators to demonstrate that they have adequate financial resources to comply with the plugging conditions of their permits. Some of the most widely used mechanisms for meeting environmental or other regulatory obligations include:

- . Surety (performance) bonds
- . Letters of credit
- . Trust funds
- . Escrow accounts
- . Financial statements.

Since some states have required demonstration of financial responsibility in the past, many operators already may be familiar with one or more of these mechanisms.

The purpose of this manual is to assist each well owner and operator in determining which of these financial responsibility mechanisms best meets his needs. Technical guidelines are provided in EPA's Technical Well Abandonment Manual.

This manual provides a general introduction to financial responsibility assurance mechanisms in order to aid well owners and operators with varying amounts of experience on the subject. It includes:

- . Background on the regulations
- . Description of financial responsibility mechanisms (Chapter II)
- . Guidelines for selecting a mechanism (Chapter III).

* Depending on which agency administers the program in a given state, the Director may be the EPA Regional Administrator or a state official.

In addition, the manual contains a glossary of financial terms as well as guidelines for calculating the comparative costs of alternative financial responsibility mechanisms.

Federal UIC regulations governing financial responsibility give the Program Director considerable flexibility. Specific requirements may vary widely across states and well classes. The well operator may therefore need to consult regulatory agency personnel, attorneys, and accountants in order to determine how the Program Director is implementing the financial responsibility requirements and what compliance options are available.

The remainder of this chapter provides background information. First, it summarizes the technical and financial provisions of the regulations. This is followed by an overview of the administrative arrangements that may be encountered. The chapter ends with a discussion of the organization of the rest of the manual.

1. REGULATORY REQUIREMENTS

Congress created the UIC program in response to evidence that injection activities could have an adverse impact on the quality of groundwater. In some cases, the contamination has been traced to improper plugging and abandonment practices. Accordingly, in carrying out its statutory obligation to establish minimum technical criteria and standards, EPA has issued rules governing the plugging and abandonment of injection wells in Classes I-III. One set of rules (40 CFR 146) stipulates plugging and abandonment methods while the other set (40 CFR 122) directs states to require permittees to demonstrate that they will have adequate financial resources to carry out their approved plugging plans.

(1) Technical Criteria and Standards

The objective of the plugging and abandonment standards is to prevent "the movement of fluids either into or between underground sources of drinking water." In order to achieve that objective, well owners and operators generally must plug their wells with cement, although Class III wells may be plugged with other materials satisfactory to the Program Director. EPA further directs that prior to placing the plugs, the well must be in a "state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the Director (40 CFR 146.10)." These requirements are discussed in greater detail in EPA's Technical Well Abandonment Manual.

The well owner or operator must prepare a "plugging and abandonment plan" as part of the permit application (40 CFR 122.42(f)). The Program Director will review this plan; and, if it is adequate, the plan will become part of the permit. If the plan is inadequate, the Director can require that the plan be revised, deny the permit application, or prescribe the conditions to be met. In preparing the plugging and abandonment plan, the well operator should consult regulatory agency permitting personnel to determine the specific information required.

(2) Financial Responsibility Requirements

The permitting regulations (40 CFR 122.42) direct that UIC permits require permittees to maintain financial resources to comply with the plugging and abandonment plan. Compliance instruments may include surety bonds, financial statements, or other assurances acceptable to the Director. In some states, at the Director's discretion, operators may be able to furnish financial assurances covering their operations statewide instead of on an individual well basis. Chapter II of this manual describes several alternatives that may be available, and Chapter III provides guidelines on how to select a mechanism.

2. PROGRAM ADMINISTRATION

The Safe Drinking Water Act (SDWA) provides for either EPA or state administration of the UIC program. Two types of state program submission are possible:

- . Primacy: EPA determines that a state program meets all the requirements set forth in the Federal rules
- . Optional Demonstration: According to section 1425 of SDWA, states with existing regulatory programs for Class II wells (used in oil/gas production) may demonstrate that these programs are as effective as the Federal requirements and fulfill the SDWA requirements.

Where states decide against accepting program enforcement responsibility, or if EPA disapproves a state's submission, the law requires EPA to establish a program. Since financial responsibility requirements may vary from state to state and different agencies may regulate each well class, operators must determine which agency regulates their wells. They should contact that agency for details on the requirements.

3. ORGANIZATION OF THE MANUAL

The next two chapters of the manual describe five alternative methods available to satisfy financial responsibility requirements. Chapter II describes the terms and conditions of and how to use each alternative. Chapter III provides a step-by-step outline of how each operator can select the approach most suitable to his circumstances.

II. MECHANISMS FOR DEMONSTRATING
FINANCIAL RESPONSIBILITY

II. MECHANISMS FOR DEMONSTRATING FINANCIAL RESPONSIBILITY

The purpose of the financial responsibility requirement is to ensure the regulatory agency's access to funds in case well operators fail to comply with the plugging and abandonment conditions of their permits. In order to assist operators in determining how to meet the requirements, this chapter describes and evaluates the financial responsibility alternatives available.

Several financial responsibility mechanisms are available, although all may not be acceptable in all states or for all operators. Five key mechanisms are:

- . Surety bonds
- . Letters of credit
- . Trust funds
- . Escrow accounts
- . Financial statements

Historically, these mechanisms have been used to ensure performance of a wide variety of Federal, State, or local regulatory obligations. In order to assist operators in selecting the most suitable mechanism, this section describes their terms, conditions, and operation.

1. SURETY BONDS

Surety, or performance, bonding is the most widely used approach for demonstrating financial responsibility, particularly in the oil and gas industry. Bonding is a mechanism whereby a licensed surety company*, in return for an annual fee paid by the operator, assumes liability for the well operator's plugging and abandonment obligation. The surety company is not released from this liability until it receives notification from the regulatory agency that the operator has performed his obligation adequately. Bonds written for individual wells cannot be cancelled even if the operator fails to pay the annual fee; and while cancellation of a blanket bond does not relieve the surety company from any liability for wells previously covered by the bond, it does absolve the company from incurring additional liability for any new wells.

* Over 300 surety companies are certified by the U.S. Treasury for bonding under Federal programs (See U.S. Treasury Department Circular 570), and others are licensed by the states.

If the operator fails to perform, the surety company is responsible for promoting proper plugging and abandonment. Depending upon state law and regulation, a bond is written either to provide a beneficiary (e.g., the regulatory agency) with funds to carry out plugging or to specify that the surety company itself will arrange for plugging. Surety companies often prefer to have a choice, since the actual cost of plugging may be less than the estimated cost upon which the bond value was established. Both approaches relieve the regulatory agency of either having to provide plugging funds or take enforcement action to recover plugging costs from the operator.

(1) Types of Bonds

Surety companies currently offer two types of plugging bonds. The most widely used is the blanket bond, which covers all of an operator's wells within a single state. Bonds may also be written for individual wells. In the past, the regulations of each state have dictated the type and value of the bond required. Exhibit II-1 shows the surety bond form which has been used in Oklahoma. It is similar to forms used in other states. Under the UIC program, state regulations will prevail in primacy states; otherwise, operators must meet rules established by EPA.

(2) Bonding Procedures

Procedures for obtaining a bond are well established, and both operators and regulators find bonding a simple mechanism to use. The operator typically will contact the agent from whom he obtains workmen's compensation and other insurance. The agent will prescribe what financial data is required. Usually, the agent will request a company's financial statement for the past one or two years. If the applicant's operation is very small, the agent probably will request a credit report.

The agent will transmit the bond application and supporting data to a branch office of the underwriter. If the operator's financial statement has not been prepared by a certified public accountant, the underwriter will take steps to verify the statement. The underwriter then will determine whether the operator appears to be financially capable of carrying out the plugging and abandonment obligations for which he is requesting a bond. If the operator's financial status is clear, the underwriter will either write or decline the bond; he may require collateral in borderline cases. Once the bond is written, the agent sends evidence of the bond to the appropriate authorities.

EXHIBIT II-1
Surety Bond Form

Firm No. 1006
Rule 3-201.21(e)
1973 Rev

Bond No. _____

OKLAHOMA CORPORATION COMMISSION
CONSERVATION DIVISION
380 Jim Thorpe Building
Oklahoma City, Oklahoma 73105

SURETY BOND FOR PLUGGING OIL, GAS AND
SERVICE WELLS WITHIN THE STATE OF OKLAHOMA

KNOW ALL MEN BY THESE PRESENTS:

That _____ as Principal,
Mailing Address _____
_____ Zip Code _____

And That _____ as Surety,
Mailing Address _____
_____ Zip Code _____

authorized to do business within the State of Oklahoma are held and firmly bound unto said State in the penal sum of Ten Thousand Dollars (\$10,000), lawful money of the United States, for which payment well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The condition of this obligation is that whereas the above bounden principal proposes to drill and/or operate an oil, gas, injection, disposal or service well or wells within the State of Oklahoma, and has furnished his agreement in writing to the Corporation Commission of the State of Oklahoma to plug each such well at the time and in the manner prescribed by the laws of the State of Oklahoma and the General Rules and Regulations and Special Orders of the Commission.

NOW, THEREFORE, if the above bounden principal shall plug each well drilled and/or operated by him within the State of Oklahoma at the time and in the manner prescribed by the laws of the State of Oklahoma and the General Rules and Regulations and Special Orders of the Corporation Commission of the State of Oklahoma, then this obligation shall be null and void; otherwise, the same shall be and remain in full force and effect. This obligation may be terminated by the Surety upon six (6) months notice in writing to the Conservation Division. (OCC Rule 3-201; 52 OS Supp 1971 §319.)

PROVIDED, HOWEVER, the aggregate liability of the surety hereunder shall in no event exceed the sum of this bond.

Witness our hands and seals, this _____ day of _____

Principal

Witness our hands and seals, this _____ day of _____

COUNTERSIGNED BY: _____
Oklahoma Resident Service Agent Surety

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent or attorney in fact, the evidence of authority must accompany the bond.)

Approved: _____ Date: _____
Conservation Division - Oklahoma Corporation Commission

(3) Costs of Bonds

All operators must pay an annual premium, which typically ranges from 1.0 to 1.5 percent of the face value of the bond. The cost of a blanket bond may range up to 5 percent or there may be an added charge for each new well. Exact rates generally are filed with and approved by state insurance commissions. While surety companies cannot impose surcharges on financially weak companies, they often provide healthier companies with discounts.

The cost may be considerably higher if the surety company requires the operator to post collateral. Surety companies are very cautious and, unlike liability insurers, theoretically assume no risk. If the surety company considers a company's financial position to be at all uncertain, they will ask for collateral equal to all or part of the bond's face value. Collateral generally consists of treasury bills, cash, certificates of deposit, government secured general obligation or revenue bonds, or an irrevocable letter of credit. By posting collateral the operator incurs an additional cost because capital is tied up in low yield investments and is not available for higher yield investments.

2. LETTERS OF CREDIT

An irrevocable letter of credit (LOC) is a less widely used approach but one which is attractive to some large companies. As applied to plugging obligations, it is an irrevocable assurance, usually provided by a bank, to pay the beneficiary (i.e., the regulatory agency) up to a certain sum in the event of operator nonperformance. In other words, if the operator fails to perform, the regulatory agency can draw funds from the bank upon the presentation of documents consistent with the terms of the letter of credit. Exhibit II-2 is the form currently used in Oklahoma for letters of credit.

The availability and cost of the letter of credit may vary according to the operator's financial status, relationship with the issuing institution, value of the LOC, and the issuing institution's outstanding loans. Letters of credit typically are available only to large companies with a substantial, verifiable net worth. Banking industry representatives suggest that large oil companies will find LOC's easy to obtain; firms with less identifiable assets or with only limited operating histories may face greater difficulties. Blue chip firms (with a AAA rating) having an established relationship with the issuing bank may pay an annual fee of no more than .25 percent of the full value of the LOC, although the cost can be as high as one percent. An additional cost to the operator is that the LOC counts against his credit line and reduces his access to

capital for expansion or investments. In some cases, the bank may require up to 100 percent collateral, applying the same terms to a LOC as to an outright loan. If collateral is required, the opportunity cost will rise considerably. Although Federal regulations limit the amount of credit a lending institution can make to any one company, this should not be a problem for injection well operators since the costs of plugging typically are relatively modest.

3. TRUST FUNDS

A trust fund is an arrangement whereby the operator deposits sufficient funds for regulatory compliance with an independent trustee. The trustee then bears legal responsibility for managing the fund for the benefit of the regulatory authority in accordance with the designated terms of the trust. These terms may include investment of the funds as well as eventual disposition of the funds for plugging and abandonment. The operator pays the trustee a management fee that is generally specified as a percentage of the size of the trust and varies with the duties of the trustee.

Once established, the trust fund cannot be terminated without the consent of both the trustee and the beneficiary, in this case the regulatory authority. Trust funds are widely used to isolate funds for government mandated programs, and are included as an option for financial responsibility assurance for EPA's hazardous waste program.

(1) Types of Funds

Trust funds may be established either by individual operators or by industry groups. All aspects of the trust such as costs, fund management, and fund disbursement can vary and will be defined in the trust agreement. The trust agreement will set forth the trustee's role and any limitations on his investment of the trust funds. The objective, for both individual and industry trusts, is to make investments which at least keep up with, and even exceed, inflation. Investment of trust funds intended for assuring regulatory compliance is generally limited to low-risk securities such as U.S. Treasury bills. Since commingling of funds from several companies within an industry for investment purposes is prohibited by law,* the SEC must authorize exemptions for investments of industry wide trust funds.

* The Glass-Steagall Act of 1933.

The regulatory agency may establish the trust terms that it will find acceptable. EPA has not established such terms in the UIC rules and intends to leave that task up to each Program Director. Thus, operators participating in trusts will want the attorney who draws up the agreement to consult with the appropriate regulatory officials in order to ascertain the acceptable terms.

(2) Cost of Trust Funds

The cost of a trust fund may vary according to management fees, payment schedule, and whether the trust is an individual or industry fund. Typical annual management fees run about 1.0 to 1.5 percent of the value of the trust.

In establishing an individual trust, the operator usually can choose from two different payment methods. The terms of the agreement may require either a lump sum payment upon establishment of the trust or may allow an annual payment into the fund. The latter approach considerably lightens the operator's financial burden by spreading payments over several years; however, the regulatory agency may be reluctant to accept the annual payment approach, because it provides less assurance that sufficient plugging funds will be available when needed. For example, if the operator goes bankrupt or ceases his operations prematurely and fails to comply with his plugging plan, the trust fund may not be sufficiently large to make adequate plugging funds available to the agency. Furthermore, as the revenues from the well decrease and the likelihood of abandonment increases, an annual payment scheme provides less assurance that the operator will be able to fulfill the trust agreement. Operators should consult regulatory agency officials before having an attorney draw up the trust papers. In some cases, the Program Director may decide to require initial establishment of a surety bond, which is gradually reduced in value as the amount in a trust fund with annual payments rises.

For industry-wide trusts, the payment schedule is always an annual one dictated by the number of participants and anticipated rate of noncompliance. These assessments are likely to be lower than those to an individual trust fund, since the probability of noncompliance for all wells covered by the fund is considerably less than that for any single well. Industry trust assessments are non-refundable; in other words, the operator cannot use such funds for plugging. Funds become available to the trust's beneficiary (i.e. regulatory agency only in the event of the operator's failure to carry out his performance obligation.

4. ESCROW ACCOUNTS

An escrow account, like a trust fund, is an account into which the operator deposits sufficient funds in advance to pay for proper plugging and abandonment. The funds may be deposited in full upon establishment of the account or over any stipulated period during the life of the well, and are disbursed to the operator either as payment for abandonment or as a reimbursement upon completion of his responsibilities. The funds may be used only to meet the costs of abandonment. An account administrator verifies deposits and disbursements. Typically, the account administrator is a financial institution or other independent third party, for whose services the operator pays an annual management fee on the order of one percent of the value of the account. Alternatively, the account may be administered directly by the regulatory authority.

Unlike a trust fund, which transfers legal title for the funds to the trustee and requires him to protect the interests of the beneficiary, the escrow account administrator is responsible only for specifying the terms of the escrow agreement and for administering the account accordingly. The operator retains legal title to the funds, and unless prohibited by the terms of the escrow agreement, may initiate the use of the funds for abandonment. Maintenance of operator title implies that, in the event of operator bankruptcy, the funds may be subject to creditors' claims. Because it is difficult to draft an escrow agreement that addresses all of these contingencies, escrow accounts have not been allowed as a financial responsibility assurance mechanism for some other regulatory programs, including EPA's hazardous waste program.

5. CORPORATE FINANCIAL TEST

A financial statement summarizes the operator's current financial position. It provides the regulatory agency with an indication of liquidity or stability but does not guarantee that sufficient funds will be available for future plugging and abandonment. Moreover, the financial data provided will not enable to the agency to predict the operator's long term financial position.

Program Directors are likely to be quite cautious in allowing operators to use financial statements as evidence of financial responsibility, since the operator does not have to set aside funds for plugging and abandonment. Thus, the acceptability of the financial statement will depend upon whether the regulatory agency is confident that a relationship exists between the value of the operator's assets and his

future willingness and financial capability of carrying out plugging and abandonment obligations.

(1) Preparation of Financial Data

Generally, the financial statement includes the following tables of financial data:

- . Income statement
- . Balance sheet
- . Statement of sources and uses of funds
- . Accumulated retained earnings statement.

The income statement presents the firm's revenues, expenditures, and profits for the preceding year. It is thus a record of the operating activities for that year. The balance sheet, in contrast, presents the firm's total accumulated assets and liabilities at the end of the reporting period, indicating the firm's net worth and liquidity. The statement of sources and uses of funds breaks down information from the income statement and balance sheet to show the firm's income sources, including operating income and sale of assets, the uses to which this cash was applied, and the resulting net change in working capital, or net current assets. This may be followed by an analysis of changes in net working capital for the reporting period, describing changes in current assets and current liabilities. Finally, the accumulated retained earnings statement indicates how much of the firm's profit for the year was retained for reinvestment and new growth after payment of stockholders' dividends.

(2) Interpretation of Data

The income statement, balance sheet, and statement of sources and uses of funds are likely to be the most useful parts of the financial statement for analyzing the firm's ability to meet well plugging and abandonment requirements. Not all states relying on financial statements to assure financial responsibility require extensive data. Exhibit II-3 presents the financial statement format currently used in Oklahoma. This essentially is a balance sheet. Income statement and balance sheet data are generally provided for two or more years, allowing analysis of trends in the firm's financial performance. Cash flow analysis based on the statement of sources and uses of funds has become

EXHIBIT II-3
Example of Financial Statement

REVISED Form No. 1006A
Rule 3-201.1 (1975)

OKLAHOMA CORPORATION COMMISSION
CONSERVATION DIVISION

380 Jim Thorpe Building
OKLAHOMA CITY, OKLAHOMA 73105

FINANCIAL STATEMENT

That _____, Operator,

Mailing Address _____

Zip Code _____

hereby attests that he has a total net worth of \$_____. The description and value of assets and liabilities are as shown below. A statement reflecting a net worth of less than \$10,000.00 is not acceptable and partial Financial Statements will be returned to the operator. If Accounts Receivable are listed, they must be accompanied by a statement attached and made a part hereof of the dollar amount of delinquent accounts. The value of producing oil and gas leaseholds for which this statement stands as security, will be deducted from total net worth unless the Financial Statement is accompanied by the written appraisal of a recognized independent appraiser of oil and gas properties showing the fair market value of the leasehold interest owned by the operator.

ASSETS

LIABILITIES

Total Net Worth \$_____

I, the undersigned, being duly sworn upon oath, state that this Financial Statement is a true and full statement of assets and liabilities.

Signature (Operator)

Title

Subscribed and sworn to before me this _____ day of _____, 19____.

My Commission Expires: _____

Notary Public

recognized as a valuable tool for interpreting the income statement and balance sheet.*

The Program Director may choose from among several available measures of financial health. Some of these may be read directly from the balance sheet, while others are best interpreted in ratio form from information contained in the balance sheet, income statement, and statement of sources and uses of funds. Unfortunately, no single measure or set of measures can be regarded as best in all cases, nor can specific threshold values be established as meaningful indicators of good financial health for firms of all sizes in different industries and circumstances. Exhibit II-4 summarizes several different approaches the regulatory agency may use in analyzing financial data.

Although other indicators of financial health are available, these are perhaps the most commonly used and have been successfully employed in other Federal regulatory programs. It should be clear from the preceding discussion, however, that no standard values can be relied upon to discern the healthy from the unhealthy firm. The regulatory authority may choose to set the requirements so high as to exclude some financially viable firms from this option in order to assure the mechanism's reliability.

(3) Cost

From the operator's perspective, submittal of a financial statement is the simplest method of demonstrating financial responsibility and involves a negligible incremental cost. Federal securities regulations require that all publicly-held companies prepare a complete set of financial statements annually, although these may be presented in consolidated form for all company operations. Most private companies prepare comprehensive financial statements for their own purposes, and hence would incur a limited incremental cost.

* A useful introduction to cash flow analysis can be found in Techniques of Financial Analysis by Erich Helfert, DBA, Fourth Edition, 1977, Chapter 1.

EXHIBIT II-4
Approaches to Financial Data Analysis

Type of Measure	Description	Advantage/ Disadvantage	Data Sources
Ability to Finance Obligations	<ul style="list-style-type: none"> . Gross measures of size <ul style="list-style-type: none"> - Net worth (or stockholder's equity) - Total assets . Large firms have more assets and lower probability of bankruptcy 	Easy to read directly from balance sheet	Balance sheet
Dependence on Creditors	<ul style="list-style-type: none"> . Extent to which operator relies on debt financing . Highly leveraged firms usually are more vulnerable, but it depends upon cash flow stability 	<ul style="list-style-type: none"> . Requires calculation of several ratios: <ul style="list-style-type: none"> - Total debt/total assets - Total debt/net worth - Long term debt/capitalization - Long term debt/net worth . Necessitates trend analysis (including cash flow volatility) 	<ul style="list-style-type: none"> . Balance sheet . Statement of sources and uses of funds
Liquidity	<ul style="list-style-type: none"> . Adequacy of assets to meet obligations as they come due 	<ul style="list-style-type: none"> . Requires calculation of several ratios: <ul style="list-style-type: none"> - Current ratio (current assets/current liabilities) - Quick ratio (cash + current receivables + marketable securities/ current liabilities) - Necessitates comparison with other firms 	Balance sheet

Type of Analysis	Description	Advantages/ Disadvantages	Data Sources
Common Size Measures	Compares permittee's financial performance with other firms of a similar asset size, in the same industry	Not comprehensive	<ul style="list-style-type: none"> . Annual surveys (e.g., Robert Morris Associates, <u>Annual Statement Studies</u>; Troy Leo, <u>Almanac of Business and Industrial Financial Ratios</u>) . Computerized services (e.g., Compustat)
Trend Analysis	Ascertain positive/negative trends in permittee's financial position over several years	Proper interpretation requires familiarity with economic cycles, industry-specific factors and their impact on individual operators	Financial statements for multiple years

III. SELECTION OF FINANCIAL
RESPONSIBILITY MECHANISM

III. SELECTION OF FINANCIAL REPOSIBILITY MECHANISM

The guidelines in this chapter are not meant to specify which alternative is most suitable in all cases. Their purpose is to identify the key questions that the operator should ask in order to determine which mechanism best fits his situation. To meet this objective the chapter focuses on three selection criteria which should be considered:

- . Availability of mechanism
- . Cost of mechanism
- . Acceptability of mechanism.

Following a brief overview of the selection process is a discussion of each selection criterion.

1. OVERVIEW OF THE SELECTION PROCESS

EPA's financial responsibility regulations are designed to meet three specific objectives:

- . Proper well plugging and abandonment
- . Minimum compliance costs to operators
- . Minimum implementation burden to both operators and regulators.

In general, surety bonds best meet all three criteria; the effectiveness of the other three mechanisms varies with the specific requirements of the regulations each Program Director has issued and the vigilance of enforcement personnel. Nevertheless, another approach may be preferable or required in certain circumstances.

The first step for the operator is to determine which agency regulates well abandonment and within that agency who is responsible for reviewing and approving permit applications. Key regulatory personnel can provide valuable assistance in applying and balancing the following three decision criteria:

- . Availability: do applicable state and Federal regulations authorize use of all alternatives and are there any restrictions based on financial status or estimated plugging costs?
- . Cost: which mechanism is most costly in terms of fees or lost investment opportunities?

- . Acceptability: does the regulatory agency regard the operator's preferred mechanism as effective in promoting proper abandonment and likely to impose a minimal administrative burden on the agency?

A general discussion of each criterion is provided below.

2. AVAILABILITY OF MECHANISMS

The first question to ask is "which financial responsibility mechanisms are legally acceptable in the state where I operate?" Most states currently regulating underground injection activities already require assurance of financial responsibility for plugging but limit the acceptable mechanism to a surety bond or collateral (cash, certificates of deposit, government bonds) deposited with the state. The oil and gas industry almost universally uses this approach. A few state agencies have accepted irrevocable letters of credit, generally submitted by Class I operators. Recently drafted amendments to the regulations explicitly recognize the acceptability of mechanisms other than surety bonds. The operator should ascertain the provisions of the state or EPA rules applicable to his wells.

A related question is whether all mechanisms authorized under the applicable regulations are equally available and acceptable. The regulatory agency may impose special conditions upon the use of a particular mechanism. For example, it may refuse to accept financial statements from companies below a certain size or require some collateral. Similarly, surety companies or banks may set special conditions on the execution of surety bonds or letters of credit. For example, the surety company may be reluctant to issue bonds below a certain value or for a long duration. Banks may require collateral for issuing a letter of credit. Acceptability to the agency is discussed at greater length below.

3. COST OF MECHANISM

The costs of financial responsibility mechanisms discussed in this manual vary widely. Cost considerations include not only the fees (such as premiums or management fees) and opportunity costs of isolated capital but also whether the alternative provides the actual abandonment funds or a post-closure reimbursement.

The cost of a given financial responsibility assurance mechanism varies with the terms of the agreement, the amount of collateral required, and the difference between the rate of interest received on invested collateral and the rate obtainable from alternative investments. Because small,

independent operators are unlikely to qualify for the best terms, their costs are likely to be the highest, as is the impact relative to their resources. Nevertheless, while the cost of the mechanism is their main consideration in choosing among alternatives, well operators indicate that the burden of demonstrating financial responsibility is rarely prohibitive. The cost elements of the five mechanisms being considered here are summarized and compared in the appendix.

(1) Financial Statement

Reliance upon financial means tests, demonstrated via the operators' financial statements, is undeniably the least-cost method of assuring financial responsibility. Because most companies routinely prepare a complete set of financial statements and because no capital is tied up in the process, the incremental cost of submitting financial statements is likely to be negligible.

(2) Letter of Credit

The letter of credit is another fairly low-cost approach. The operator sets aside no funds to pay for closure, and thus incurs only administrative costs. Operators who are favored customers of the issuing institution are likely to pay an annual management fee of only one quarter of one percent of the value of the credit line. However, an indirect cost is that less credit is available for expansion or other investment.

(3) Surety Bonds

Bonding is incrementally more expensive than financial statement preparation and letters of credit, but generally less expensive than trust funds or escrow accounts. The total cost of the bond may vary with the terms, collateral required, and coverage of the bond. For operators with multiple operations, the average cost per well is likely to be lower if a blanket bond is obtained.

Bonding is available to most applicants upon payment of an annual premium of 1.0 to 1.5 percent of the face value of the bond, although small or financially weak operators may be required to post collateral in the form of cash, certificates of deposit, or a bank letter of credit. The surety company retains this collateral until abandonment is completed. If a letter of credit is accepted as collateral, the operator must pay an additional 1.0-1.5 percent to the issuing bank, although this may be heavily discounted for large customers. For other forms of collateral, the operator incurs an opportunity cost equal to the difference between any return on invested

collateral and the return he could otherwise obtain by investing it himself.

(4) Trust Fund or Escrow Account

The cost of a trust fund or escrow account is similar to that of a surety bond backed by interest-bearing collateral, assuming that the annual administration fees and return on investment of the funds are similar to that of the surety bond and that the funds are deposited as a lump-sum upon establishment of the account. If the account is accumulated over the life of the well through annual deposits, the operator has greater use of the funds for alternative investment. In that case, the cost would be lower than that of a surety bond with collateral, which is generally posted at the time the bond is secured.

4. ACCEPTABILITY OF MECHANISM

The operator's choice of financial responsibility mechanism must be acceptable to the regulatory agency in order to ensure the success of his permit application. Acceptability is a matter of effectiveness in promoting proper abandonment and avoidance of the likelihood of an unreasonable administrative burden on the agency. Although several mechanisms may be available to operators, all may not be acceptable for all operators under all circumstances. In order to facilitate quick processing of the permit application, the operator can try to ascertain in advance of completing the application which mechanism(s) the agency is likely to accept.

(1) Surety Bonds

Surety bonds are the most effective of the five financial mechanisms considered here for promoting proper well plugging and abandonment. The availability of funds is guaranteed by the surety company, which assumes responsibility should the operator fail to perform. In contrast to trust funds and escrow accounts, the availability of funds is not dependent upon establishment and maintenance of an independent account. As long as the surety company remains financially viable itself, it is legally obligated to assume responsibility according to the terms of the agreement. If performance of compliance activities rather than payment of the face value of the bond is required by the agreement, this mechanism guarantees not only the availability of funds but the completion of proper abandonment procedures as well.

Surety bonds are considerably easier for the regulatory agency to implement than most other financial responsibility alternatives. Since most states which have

well operations also have surety bond requirements which predate the Federal UIC rules, state program managers are often familiar with the mechanism. In addition, since the surety company conducts the requisite financial analysis, issues the bond, and notifies the agency of any change of status, this mechanism poses no significant technical or manpower demand on the agency.

(2) Letters Of Credit

Letters of credit provide almost as much assurance for the regulatory agency as surety bonds. If the operator fails to comply with the plugging conditions of his permit, the agency can present documentation to the bank enabling it to draw against the operator's line of credit in order to obtain funds for abandonment.

Letters of credit may have a greater impact on the agency than surety bonds do. Unlike surety bonds, under which the surety company often carries out the plugging in the case of an operator's noncompliance, letters of credit place responsibility for plugging upon the regulatory agency. Furthermore, the agency has the burden of trying to recover costs from the operator. Consequently, letters of credit may be marginally less acceptable to regulators.

(3) Trust Fund and Escrow Account

Both trust funds and escrow accounts offer an advantage in that they isolate funds specifically intended for abandonment in advance, when the operators' financial interest in the well is greatest. Assurance of the availability of funds is greatest if the entire cost of abandonment is deposited in the account at the time the well is drilled. Annual deposits ease the operator's financial burden but increase the risk that the account will never be filled, since the well may be abandoned when annual profits fall below the amount of annual deposits to the account.

Despite their similar approach to isolating funds for compliance, trust funds are superior to escrow accounts in that legal title to the trust fund is assumed by the beneficiary (i.e., the regulatory agency), preventing the operator from revoking the trust. The agreement generally specifies that the operator will gain access to the funds only after plugging is complete. If the size of an individual operator's fund is greater than the actual cost of abandonment, holding the funds until after abandonment

is completed imposes an additional incentive to comply. In case of nonperformance, the funds are payable to the state. Thus, eventual availability and use of the funds is assured. In the meantime, the trustee is obligated to invest the funds in the beneficiary's interest.

In contrast to an individual trust fund, an industry trust fund encourages compliance by reducing the size of assessments in return for a high industry compliance rate, and thus promotes industry policing of individual operators. Should the noncompliance rate exceed its anticipated level, however, sufficient funds may not be available in the industry trust in any given year. For this reason, industry trusts may have selective memberships to avoid subsidizing unreliable operators by their financially sound associates.

The implementation burden of trust funds and thus their acceptability to the regulatory agency depends on the type of trust and its specific terms. The agency must monitor deposits to an individual trust or payment of annual assessments to an industry trust to assure that funds are being made available. Although the financial burden to the operator is somewhat greater, the administration of individual trusts is made simpler by requiring a lump-sum deposit of funds upon initiation of the trust, rather than a gradual accumulation of the fund. The regulatory agency may prefer the lump-sum deposit since it provides a better guarantee of the availability of funds. With regard to industry trusts, the agency must certify compliance rates and determine the appropriate size of assessments as well as monitor their payment by operators.

The use of escrow accounts to demonstrate financial responsibility may prove cumbersome for the regulatory agency, without offering specific advantages beyond those of a trust fund. In addition to providing less control for the regulatory agency, the operator's maintenance of legal title encourages the account administrator to manage the account in the operator's interest, subject to the constraints of the escrow agreement. The agency must therefore monitor the account more closely than a trust fund. Furthermore, in the event of operator bankruptcy, the funds in escrow may be legally subject to creditors' claims, endangering their availability for well plugging and abandonment.

(4) Financial Statement

Financial means tests, as portrayed via the operator's financial statements, provide the least assurance of proper abandonment afforded by the five mechanisms considered here and therefore are likely to be the least widely acceptable to regulators. While operator financial health serves as an indicator of impending bankruptcy and hence warns of the need to establish a more dependable financial responsibility assurance mechanism, it provides no direct guarantee of performance other than for maintenance of a good relationship with the regulating agency in order to be able to continue using this low-cost mechanism. No funds are set aside for compliance and no responsible third party stands ready to assume financial responsibility should the operator fail to perform. The agency is likely to bear the burden of plugging and abandonment in the event of operator nonperformance. Assuming that meaningful financial tests could be devised and applied to all operators, agencies may have neither sufficient manpower nor the technical expertise to evaluate operators' financial statements or to monitor their fluctuating status. In addition to burdening agency resources, reliance upon faulty financial analysis may defeat the purpose of financial responsibility requirements by certifying financially unqualified operators and exposing the agency to unnecessary risk if the operator fails to perform. The agency therefore is likely to set stringent requirements and to require immediate establishment of an alternative mechanism if the operator's financial position begins to deteriorate, which is precisely when such a change is least affordable.

* * * * *

While each of the alternatives discussed above has advantages and disadvantages, surety bonds guaranteeing performance appear to be the most consistent with EPA's objectives of proper well abandonment and minimizing cost to the operator and administrative burden to the state regulatory agency. Letters of credit offer low cost to the operator, but the potential requirement for greater regulatory agency activity in the event of operator nonperformance reduces the likelihood of acceptance. Trust funds offer an attractive alternative for operators who cannot obtain a bond even with collateral. Escrow accounts offer similar advantages, but are relatively unattractive to regulatory agencies compared to trust funds and serve no additional useful purpose. Submission of financial statements is likely to be the most popular alternative with operators, but does not assure compliance and will probably be considered only for firms that are very stable financially.

APPENDIX A

EXHIBIT A-1
Cost Elements of Alternative
Financial Responsibility Assurance Mechanisms

Financial Instrument	Description of Cost Elements	Cost Discounting Equation
Financial Statement	Costs of abandonment incurred by operator when well is abandoned. Total cost equals present value of abandonment costs discounted at operator's real cost of capital. Preparation of statement involves no incremental cost.	$TC = \frac{C}{(1+r)^n}$
Surety Bond (No Collateral) and Letter of Credit	Costs of abandonment incurred by operator when well is abandoned. Total cost equals sum of present values of abandonment costs and annual premium charges, discounted at operator's real cost of capital.	$TC = \frac{C}{(1+r)^n} + SC \left[\frac{(1+r)^n - 1}{r(1+r)^n} \right]$
Surety Bond (100% Collateral)	Costs of abandonment incurred by operator when bond is purchased and held by surety as interest-bearing collateral. Total cost equals present value of abandonment costs at time of abandonment, discounted at real market rate of interest, plus present value of annual bond premium charges, discounted at operator's real cost of capital.	$TC = \frac{C}{(1+i)^n} + SC \left[\frac{(1+r)^n - 1}{r(1+r)^n} \right]$
Trust Fund/ Escrow Account (Lump Sum Initial Deposit)	Costs of abandonment incurred by operator when interest-bearing account is established. Total cost equals present value of abandonment costs at time of abandonment, discounted at real market rate of interest, plus present value of annual account administration fees, discounted at operator's real cost of capital.	$TC = \frac{C}{(1+i)^n} + SC \left[\frac{(1+r)^n - 1}{r(1+r)^n} \right]$

Key:

- r = Operator's real rate of return
- i = Real market interest rate
- n = Number of years until well abandonment
- SC = Annual service charge (in dollars) on bond, escrow account, or trust fund
- C = Cost at time of abandonment
- TC = Present value of costs of abandonment plus financial responsibility demonstration

APPENDIX B

EXHIBIT B-1
Total Cost of Well Abandonment
Using Alternative Financial Responsibility
Assurance Mechanisms (1980 Dollars)*

	One Year Before Abandonment	Five Years Before Abandonment	Ten Years Before Abandonment	Twenty Years Before Abandonment
Financial Statement				
$r^{**} = 5.0\%$	\$9,524	\$7,836	\$4,810	\$3,769
$r = 7.5\%$	\$9,302	\$6,139	\$3,380	\$2,354
Surety Bond (No Collateral)				
$r = 5.0\%$	\$9,619-9,667	\$8,268-8,484	\$6,911-7,297	\$5,015-5,638
$r = 7.5\%$	\$9,395-9,442	\$7,371-7,593	\$5,538-5,882	\$3,373-3,883
Letter of Credit (No Collateral)				
$r = 5.0\%$	\$9,548-9,619	\$7,945-8,268	\$6,347-6,926	\$4,085-5,015
$r = 7.5\%$	\$9,369-9,395	\$7,067-7,371	\$5,024-5,538	\$2,609-3,373
Surety Bond (100% Collateral)				
Escrow Account				
(Initial Lump-sum Deposit)				
Trust Fund				
(Individual Operator, Initial Lump-sum Deposit)				
$r = 5.0\%$	\$9,899-9,947	\$9,490-9,706	\$8,975-9,361	\$7,975-8,599
$r = 7.5\%$	\$9,897-9,944	\$9,462-9,664	\$8,889-9,233	\$7,749-8,260

* Assumes cost of abandonment equals \$10,000 in 1980 dollars at time of abandonment.

** r = Operator's real rate of return

*** i = Real market interest rate

+SC= Annual service charge on bond, escrow account, or trust fund, as a percentage of total value

APPENDIX C

GLOSSARY OF FINANCIAL TERMS

ASSETS	The items owned by a firm, the value of which are shown on its balance sheet at cost or cost less depreciation.
BALANCE SHEET	A statement of a firm's financial condition at a given date, as indicated by the book value of assets and liabilities.
BENEFICIARY	The person or organization (in this case the regulatory agency) designated to receive the funds held in trust or escrow.
BLANKET BOND	A surety bond covering more than one well within a state.
CAPITALIZATION	The total liabilities of a business, including both ownership capital (equity) and borrowed capital.
CASH FLOW	(1) Changes in a firm's cash account over a given period caused by the timing of revenues and expenditures. (2) A measure of corporate worth that includes net income after taxes plus the value of tax allowances for depreciation and depletion.
COLLATERAL	Property pledged by a well operator to secure the interests of a surety company or financial supporter in case of failure of the operator to perform as agreed.
COMMON SIZE MEASURE	Analysis of a firm's financial performance relative to other firms of similar size in the same industry, as indicated by comparing values or trends in values of financial variables or ratios.

CURRENT ASSETS	Cash and other assets that are reasonably expected to be realized in cash or sold or consumed during the normal operating cycle of the business or within one year, whichever is shorter.
CURRENT LIABILITIES	Obligations whose liquidation is reasonably expected to be satisfied by the use of current assets or the creation of other current liabilities, or those expected to be satisfied within the normal operating cycle of the business or within one year, whichever is shorter.
DEBT FINANCING	A firm's generation of capital by borrowing, either from a bank or through the sale of corporate bonds to the public.
DEPRECIATION	An allowance deducted from the cost of a fixed asset to allow for aging, and providing for a tax credit for the loss in value.
EQUITY FINANCING	A firm's generation of capital by sale of ownership through new issues of corporate stock.
INCOME STATEMENT	That portion of a firm's financial statement which indicates profit and loss during a given time period.
LEVERAGE	The proportion of a firm's debts, bonds, and preferred stock relative to the value of its common stock.
LIABILITIES	Any direct financial obligation, including current liabilities and long-term debt.
LIQUIDITY	The ease with which assets may be converted to cash.
LONG-TERM DEBT	That portion of a firm's obligations that are not expected to be paid in less than a year.

NET CURRENT ASSETS	The excess of current assets over current liabilities; equivalent to working capital.
NET PROFIT	The income remaining from all sources after deducting all expenses, including corporate taxes and interest on loans, and available for distribution to stockholders or retained as earnings.
NET WORTH	Total assets minus total liabilities and is equivalent to stockholders equity.
OBLIGEE	Individual or firm (the well owner or operator) obligated to perform in compliance with the requirements of a surety bond, escrow, or trust agreement.
OPPORTUNITY COST	The value of the alternative opportunities foregone in order to achieve an objective. The opportunity cost of capital in trust or escrow or posted as collateral is equal to the return that could have been earned from that capital if invested elsewhere.
PERFORMANCE BOND	Surety bond.
PLUGGING BOND	Surety bond written to assure payment for or performance of proper well plugging and abandonment.
RETAINED EARNINGS	The accumulated total profits which have been undistributed by a firm, and included in the net worth or equity section of the balance sheet.
STOCKHOLDER'S EQUITY	The net worth of a firm after all obligations have been paid.
10-K REPORT	Annual report required by the U.S. Securities and Exchange Commission of all publicly traded companies, containing a complete set of financial statements and summary of operations for the past year.

TREND ANALYSIS

Analysis of changes in value of particular financial indicators over time for a single firm or for a group of firms.

TRUSTEE

An individual or company which manages the assets of the obligee for a beneficiary according to the requirements of a trust agreement.

WORKING CAPITAL

Funds available for general operations and unforeseen events, represented by the excess of current assets over current liabilities; equivalent to net current assets.

