State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER	PAGE
DEP13887	1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
CHUCK BOWMAN
304-558-2157

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO
ENVIRONMENTAL PROTECTION
DEPARTMENT OF
OFFICE OF ADMINISTRATION
601 57TH STREET SE
CHARLESTON, WV
25304 304-926-0499

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B	FREIGHT TERMS
12/14/2006				

BID OPENING DATE: 12/21/2006 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT

********** ADDENDUM NO. 2 **********

ADDENDUM ISSUED FOR ACTUARIAL SERVICES CONTRACT TO INCORPORATE VENDOR QUESTIONS AND ANSWERS TO THE SPECIFICATIONS.

PLEASE SEE ATTACHED DOCUMENTATION.

BID DATE EXTENDED FROM 12/20/06 TO 12/21/06. BID OPENING TIME REMAINS 1:30 PM.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE

TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia

2. The State may accept or reject in part, or in whole, any bid.

3. All quotations are governed by the ***West Virginia Code*** and the ***Legislative Rules*** of the Purchasing Division.

4. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required $125.00 registration fee

5. All services performed or goods delivered under State Purchase Orders/Contracts are to be continued for the term of the Purchase Order/Contract, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods, this Purchase Order/Contract becomes void and of no effect after June 30.

6. Payment may only be made after the delivery and acceptance of goods or services.

7. Interest may be paid for late payment in accordance with the ***West Virginia Code***.

8. Vendor preference will be granted upon written request in accordance with the ***West Virginia Code***.

9. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

10. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.

11. The laws of the State of West Virginia and the ***Legislative Rules*** of the Purchasing Division shall govern all rights and duties under the Contract, including without limitation the validity of this Purchase Order/Contract.

12. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.

13. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, this contract is automatically null and void, and is terminated without further order.

14. **HIPAA Business Associate Addendum -** The West Viginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, and available online at the Purchasing Division's web site **(http://www.state.wv.us/admin/purchase/vrc/hipaa.htm)** is hereby made part of the agreement. Provided that, the Agency meets the definition of a Covered Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division.

2. **SPECIFICATIONS:** Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications

3. Complete all sections of the quotation form.

4. Unit prices shall prevail in cases of discrepancy

5. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.

6. **BID SUBMISSION:** All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications

SIGNED BID TO:

Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

DEP13887
Addendum No. 2

Issued per the following vendor questions/clarifications and agency responses.

Question: The RFQ contained a "Vendor Preference Certificate". Does the certificate need to be completed and submitted along with the proposal if a firm does not qualify for any of the benefits identified in the certificate?

Answer: No

Question: How many copies of the proposal must be submitted?

Answer: One

Question: Who is the incumbent actuary for this assignment?

Answer: The Hay Group

Question: Will the prior actuarial analysis be made available to us prior to submitting our proposal?

Answer: Yes and see attached.

Question: Throughout the RFQ it is noted that the actuary assigned to the project must be a "Fellow of the Society of Actuaries" If the actuary assigned to the project is instead a "Fellow of the Casualty Actuarial Society", will that be acceptable?

Answer" Yes.

Question: The scope of assignment as outlined in the RFQ reads that the winning bidder must "participate in an on-site entrance conference involving interviews of each Special Reclamation Advisory Council member and other significant staff". How many people make up the Special Reclamation Advisory Council and what is the expected number of "other significant staff"?

Answer: There are eight (8) members on the SRAC, with one vacancy currently existing. Significant staff would include three (3) representatives from the Special Reclamation Program, the Assistant Director of the Division of Mining, and the WVDEP Controller

Question: As stated in the RFQ, Scope items b2 and b3, the vendor shall provide "an evaluation of the present (06/30/06) assets and liabilities of the Special Reclamation Fund for a minimum of twenty (20) years, including an annual table illustrating those assets and liabilities for underground vs. surface mine permits, small vs. large acreage permits, and permits for tipples, preparation plants, and impoundments and illustrating land and

water liabilities separately". Please confirm that the vendor is required to provide the pro forma financial statements in the following two ways:

- Split between underground vs. surface mine permits, small vs large acreage permits, and permits for tipples, preparation plants and impoundments (and combined), and
- Split between land and water liabilities (and combined).

Answer: The RFQ requires a minimum 20 year table illustrating assets and liabilities. Separate and distinct liabilities are required for the land capital, water capital and water treatment operating for underground mine permits, surface mine permits, permits for tipples, permits for preparation plants, and permits for impoundments. A separate table should illustrate the liabilities for land capital, water capital, and water treatment operating for large vs. small acreage permits

Question: The scope of assignment calls for "a dynamic evaluation of the prospective assets and liabilities of the Special Reclamation Fund..... Please confirm that this is not intended to be a dynamic financial analysis simulation of the SRF, but rather an analysis of the SRF under a few different sets of assumptions

Answer: The evaluation of the assets and liabilities of the Special Reclamation Fund is intended to be a dynamic financial analysis simulation of the Fund for the next 20 years

Question: What is the expected duration, in days, of each of the five onsite meetings to be held at the Department of Environmental Protection?

Answer: The first onsite meeting will be spent conducting interviews with the Special Reclamation Fund Advisory Council members and WVDEP staff outlined above. This will be a full 8 hr day The other meetings will usually begin at 10:00 am and last until 3:00 pm.

Question: Will data related to this assignment be provided in electronic format?

Answer: Yes.

State of West Virginia

DEPARTMENT OF ENVIRONMENTAL PROTECTION

2005 Actuarial Valuation of Special Reclamation Fund

REPORT

October 6, 2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

SECTION 1 10
ENVIRONMENTAL LIABILITY ACTUARIAL VALUATION

SECTION 2 31
DETERMINATION OF FUTURE FUNDING TO ENSURE SOLVENCY OF THE PROGRAM

SECTION 3 35
COMPARISON OF FUNDING MECHANISMS IN OTHER STATES

SECTION 4 45
DATA

SECTION 5 51
ACTUARIAL ASSUMPTIONS

EXECUTIVE SUMMARY

This report provides the Department of Environmental Protection (DEP) with information on the funded status of the Special Reclamation Fund (SRF) and an analysis of the fund's projected financial status under a range of operational parameters. The previous actuarial study was completed in 1993.

This report includes liabilities for reclamation activities on permits that have been forfeited as well as expected future reclamation activities on permits that have been issued. We believe it is appropriate to include the liabilities for permits that may be forfeited in the future for several reasons, including the guidance set out in Governmental Accounting Standard Number 10, an excerpt of which is:

State and local governmental entities other than public entity risk pools are required to report an estimated loss from a claim as an expenditure expense and as a liability if both of these conditions are met:

a. Information available before the financial statements are issued indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statements. It is implicit in this condition that it must be probable that one or more future events will also occur, confirming the fact of the loss.

b. The amount of the loss can be reasonably estimated.

With regard to the basis for the fund's liabilities, we believe the accounting rules are framed to require the fund to account for both known forfeitures and anticipated forfeitures from existing permits. Accordingly, we have included in this report reclamation liabilities based on the date of forfeiture as well as based on the date of permit to provide the SRF Advisory Committee with a complete picture of the fund's obligations.

SRF Liabilities

Table A shows the present value of future cash expenditures from 2005 to 2025 associated with land capital expenditures, water capital expenditures, ongoing water treatment expenditures, and administrative costs. These amounts include the DEP estimated costs for reclamation activities on permits that have already been forfeited, including on-going water treatment costs. The amounts shown in Table A are the discounted present value of projected cash flows using a discount rate of 2.50 percent. The results exclude cash costs that occur after the 20-year projection period. A complete description of the assumptions used in the valuation can be found in Section 5.

Table A Reclamation Liability as of June 30, 2005 for Known and Expected Forfeitures (Amounts shown in $millions)			
Type of Liability	For Permits Forfeited Prior to July 1, 2005	For Expected Forfeitures After June 30, 2005	Total Reclamation Liabilities
Land Capital	$ 35.6	$ 96.0	$ 131.6
Water Capital	$ 15.6	$ 8.6	$ 24.2
Ongoing Water Treatment	$ 40.6	$ 24.1	$ 64.7
Administration Costs [1]	$ 6.3	$ 57.2	$ 63.5
Total	$ 98.1	$ 185.9	$ 284.0

The Special Reclamation Fund (SRF) receives revenues from several sources. The primary funding source is a tax on current coal sales. The second funding source occurs when permits are forfeited, as the SRF collects the bond amounts associated with the forfeited permits, and/or civil penalties and court settlements. Lastly, the SRF's assets are invested in a fixed income fund managed by the West Virginia Investment Management Board, and therefore the SRF earns interest income. Table B shows the present value of the expected future coal tax receipts, bond forfeiture and civil penalties, and projected investment income/borrowings from 2005 to 2025. Future revenue streams have been discounted at 2.50 percent. The results exclude revenues that occur after the 20-year projection period. Before the end of the projection period the SRF assets are projected to be exhausted, resulting in a negative fund balance. As the SRF is prohibited from borrowing, in the absence of additional funds, the SRF would delay commencement of reclamation projects or take other actions to reduce its expenses. For the purposes of this report we have projected reclamation expenses to be paid in accordance with the valuation model, resulting in a projected deficit.

Table B Present Value of Future Revenue Sources as of June 30, 2005 (Amounts shown in $millions)			
Coal Tax Revenue	Bond Forfeiture, Civil Penalties, and Court Settlements	Interest Income	Total
$ 106.8	$ 30.2	$ 3.2	$ 140.2

As of June 30, 2005, the SRF had invested assets of $29.6 million. Table C combines the projected reclamation liabilities, SRF current assets and expected future revenue to produce the Funded Status.

[1] Administration costs are not directly attributable to permit forfeiture dates

A Funded Status of at least 100 percent means the current revenue structure (i.e. legislated coal tax revenues and amounts of permit bonds) should provide sufficient funding to meet the long-term obligations of the SRF. A Funded Status of less than 100 percent indicates that the SRF assets, combined with expected future revenues are insufficient to fund expected future expenses.

Table C Funded Status as of June 30, 2005 Amounts in $millions	
1. Present Value of Future Revenues	$140.2
2. SRF Fund Assets as of June 30, 2005	$29.6
3. SRF Fund Assets plus Present Value of Future Revenues (1. + 2.)	$169.8
4. Present Value of Future Reclamation Expenditures	$284.0
5. Funded Status = (3) / (4)	59.8%

Table C shows the Special Reclamation Fund has a funded status of about 60 percent. If emerging experience is more favorable than that assumed in the valuation, the funded status could move closer to 100 percent.

The funded status is currently below 100 percent. However, even for systems with a funded status above 100 percent, an additional management concern is whether funds are available to pay expenses when they fall due. We have therefore included a 20-year cash flow projection to illustrate the effect of timing of expenses and revenues on the fund's assets.

Table D shows the projected cash flow over the next 20 years. The elements shown in the projection are:

Expenditures, comprising:

- Land capital expenditures
- Water capital expenditures
- Ongoing water treatment expenditures
- Administration costs

Revenues, comprising:

- Coal tax receipts
- Bond forfeitures, civil penalties, and court settlements
- Investment income

The investment income is determined as 2.50 percent of the prior year-end closing fund balance. In the projection, in years where the fund balance is negative the investment income is set to zero.

Table D shows that under the baseline assumptions, the fund balance is expected to grow to $32.0 million as of June 30, 2006 and then decline thereafter, reaching zero in FY 2012.

Table D shows the projected cash flow for the next 20 years under current law. Under current law, the coal tax of 14 cents per ton decreases to 7 cents per ton as of October 1, 2006.

Table D – Projected Cash Flow for 2005 - 2025

Fiscal Year Ending	Land Capital Expenditures	Water Capital Expenditures	Ongoing Water Treatment Expenditures	Admin Costs	Total Expenditures	Coal Tax Receipts	Bond Forfeitures, Civil Penalties, etc	Investment Income	Total Income	Fund Balance
Jun-05										$ 29.6
Jun-06	$ 8.6	$ 7.7	$ 2.0	$ 2.6	$ 20.9	$ 19.3	$ 3.3	$ 0.7	$ 23.3	$ 32.0
Jun-07	$ 7.7	$ 4.5	$ 2.2	$ 2.7	$ 17.1	$ 11.3	$ 3.1	$ 0.8	$ 15.2	$ 30.1
Jun-08	$ 18.7	$ 3.6	$ 2.5	$ 2.8	$ 27.6	$ 8.5	$ 2.9	$ 0.8	$ 12.2	$ 14.7
Jun-09	$ 2.2	$ 0.3	$ 2.6	$ 2.9	$ 8.0	$ 8.1	$ 2.6	$ 0.4	$ 11.1	$ 17.7
Jun-10	$ 10.8	$ 1.0	$ 2.9	$ 3.0	$ 17.7	$ 7.5	$ 2.4	$ 0.4	$ 10.3	$ 10.4
Jun-11	$ 10.3	$ 0.9	$ 3.2	$ 3.0	$ 17.4	$ 6.9	$ 2.2	$ 0.3	$ 9.4	$ 2.3
Jun-12	$ 9.7	$ 0.9	$ 3.4	$ 3.1	$ 17.1	$ 6.4	$ 2.0	$ 0.1	$ 8.5	$ (6.4)
Jun-13	$ 9.1	$ 0.8	$ 3.7	$ 3.2	$ 16.8	$ 5.9	$ 1.9	$	$ 7.8	$ (15.4)
Jun-14	$ 8.5	$ 0.8	$ 3.9	$ 3.3	$ 16.5	$ 5.5	$ 1.8	$	$ 7.3	$ (24.6)
Jun-15	$ 8.0	$ 0.7	$ 4.1	$ 3.4	$ 16.2	$ 5.2	$ 1.7	$	$ 6.9	$ (34.0)
Jun-16	$ 7.7	$ 0.7	$ 4.3	$ 3.5	$ 16.2	$ 4.9	$ 1.6	$	$ 6.5	$ (43.8)
Jun-17	$ 7.4	$ 0.7	$ 4.5	$ 3.6	$ 16.2	$ 4.6	$ 1.5	$	$ 6.1	$ (54.1)
Jun-18	$ 7.1	$ 0.6	$ 4.7	$ 3.7	$ 16.1	$ 4.4	$ 1.4	$	$ 5.8	$ (64.5)
Jun-19	$ 6.8	$ 0.6	$ 4.9	$ 3.9	$ 16.2	$ 4.2	$ 1.3	$	$ 5.5	$ (75.3)
Jun-20	$ 6.6	$ 0.6	$ 5.1	$ 4.0	$ 16.3	$ 4.1	$ 1.2	$	$ 5.3	$ (86.2)
Jun-21	$ 6.3	$ 0.6	$ 5.3	$ 4.1	$ 16.3	$ 3.9	$ 1.1	$	$ 5.0	$ (97.4)
Jun-22	$ 6.0	$ 0.5	$ 5.4	$ 4.2	$ 16.1	$ 3.8	$ 1.0	$	$ 4.8	$ (108.8)
Jun-23	$ 5.8	$ 0.5	$ 5.6	$ 4.3	$ 16.2	$ 3.6	$ 1.0	$	$ 4.6	$ (120.5)
Jun-24	$ 5.6	$ 0.5	$ 5.7	$ 4.5	$ 16.3	$ 3.4	$ 0.9	$	$ 4.3	$ (132.5)
Jun-25	$ 5.3	$ 0.5	$ 5.9	$ 4.6	$ 16.3	$ 3.2	$ 0.8	$	$ 4.0	$ (144.8)
Jun-26	$ 5.1	$ 0.5	$ 6.0	$ 4.7	$ 16.3	$ 3.0	$ 0.8	$	$ 3.8	$ (157.3)

Following the executive summary is an Actuarial Certification.

Section 1 describes the actuarial model and the assumptions used to estimate the revenues and liabilities of the Special Reclamation Fund.

Section 2 examines options for managing the program to ensure solvency.

Section 3 provides a comparison of the funding mechanisms used by several other states, including the leading coal producing states.

Section 4 describes the data reviewed and used in the report.

Section 5 describes the actuarial assumptions used in the valuation.

The timely completion of our report depended on quick and complete responses to our data and information requests. The DEP staff provided us with timely and complete responses to all of our requests for information. We wish to thank them for their time and providing us with their counsel as well as the information that we used in this report.

ACTUARIAL CERTIFICATION

The State of West Virginia's Department of Environmental Protection retained the Hay Group to perform an actuarial valuation of the Special Reclamation Fund for the purposes of reporting the progress of the Fund. The Hay Group retained the services of Tiller Consulting Group, Inc to assist in the valuation.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices.

The actuarial assumptions and methods employed in the measurement of the liability have been selected by the Hay Group and Tiller Consulting Group, Inc after consultation with the staff of the DEP and the Special Reclamation Fund Board

The results shown in this report are reasonable actuarial results. However, a different set of results could also be considered reasonable actuarial results. The reason for this is that actuarial standards of practice describe a "best-estimate range" for each assumption, rather than a single best-estimate value. Thus, reasonable results differing from those presented in this report could have been developed by selecting different points within the best-estimate ranges for various assumptions.

The actuaries certifying to this valuation are members of the American Academy of Actuaries, the Society of Actuaries and other professional actuarial organizations and meet the General Qualification Standards of the American Academy of Actuaries for purposes of issuing Prescribed Statements of Actuarial Opinion.

Adam J. Reese

Adam J. Reese, FSA, FIA, MAAA, FCA, EA
Senior Consultant
Hay Group

Margaret T Sherwood

Margaret Tiller Sherwood, FCAS, ASA, MAAA, FCA, CPCU, ARM
President
Tiller Consulting Group, Inc.

October 6, 2005

SECTION 1

ENVIRONMENTAL LIABILITY ACTUARIAL VALUATION

BACKGROUND

We began our review of the SRF's liabilities by reviewing the prior actuarial study, which was completed in 1993. We also reviewed the readily available information provided for this actuarial study.

GASB 10 states that liabilities are incurred when the events setting them in place occur. Paragraph 22 of GASB 10 states:

> A liability for unpaid claims costs, including estimates of costs relating to incurred but not reported (IBNR) claims, should be accrued when insured events occur or, for claims-made policies, in the period in which the event that triggers coverage under the policy or participation contract occurs. That liability should be based on the estimated ultimate cost of settling the claims (including the effects of inflation and other societal and economic factors), using past experience adjusted for current trends and any other factors that would modify past experience. Claim accruals for IBNR claims should be made if it is probable that a loss has been incurred and the amount can be reasonably estimated. Changes in estimates of claims costs resulting from the continuous review process and differences between estimates and payments for claims should be recognized in results of operations of the period in which the estimates are changed or payments are made. Estimated recoveries on unsettled claims such as salvage or subrogation, should be evaluated in terms of their estimated realizable value and deducted from the liability for unpaid claims.

The 1993 actuarial study assumed that the event that incurred the liability was when a permit was forfeited. However, we believe that the more appropriate event is when the permit is issued. After a permit has been issued, the mine operator may disturb the land, and if the permit is subsequently forfeited, there is a likelihood that the SRF will incur new expenses to reclaim the land and treat water to bring it into compliance with current environmental protection standards. The change in the event definition required that we construct a new model to estimate SRF's reclamation cost liability.

ACTUARIAL MODEL

The actuarial model we developed combines DEP estimated reclamation expenses for permits that have already been forfeited with our projection of expenses associated with future forfeited permits.

The actuarial model uses separate rates to project the number of existing permits as of the measurement date that are expected to be released and the number that are expected to be forfeited. The model assumes that the SRF will not incur additional expenses when a permit is released. The model projects four types of expenses associated with a forfeited permit. In addition, a forfeited permit is expected to produce revenues to the SRF in the form of the amount of the bond associated with the permit, and/or any associated civil penalties or court settlements.

The three types of reclamation expenses associated with a forfeited permit are:

- Land capital expenditures
- Water capital expenditures
- Ongoing water treatment costs

Some sites only require land capital expenditures, while others require both land and water capital expenditures. The model assumes that where water capital expenditures are incurred there will also be ongoing water treatment costs. Some expenses that DEP originally categorized as water capital costs were designated as land capital costs for the purpose of this study because DEP expects no ongoing water treatment at these sites. The reclamation costs are developed based on a projection of the acreage and status of each permit, using average amounts per permit-acre. Therefore, the water capital expenditures are projected for all permits, even though some sites may not require water treatment activities.

In addition, the model includes a projection of the administration costs that will be incurred in the oversight of the reclamation activities. The model assumes that the administration costs are independent of the reclamation expenses and would increase in the future in line with price inflation.

The development of the assumptions for each of these costs is shown below.

The actuarial model was applied to a database of all existing issued permits that have not been released or forfeited. The data on each permit included:

- Date permit issued
- Status of the permit
- Number of permitted acres
- Total current bond amount

The model projected the number of permits expected to be released or forfeited each year in the next 20 years.

The projection of permit forfeiture was also used to determine the expected revenues from bond forfeiture and/or civil penalties and court settlements.

The actuarial model produced as output expected cash flows over the next 20 years. These cash flows were incorporated into a cash flow model that included projected tax receipts from coal

production. The resulting fund balance was assumed to be invested in the WVIMB fixed income fund, producing income at a rate of 2.50 percent of the invested fund balance.

THE ASSUMPTIONS

The actuarial model used the following assumptions, each of which was developed from an analysis of experience data

- Rates of release of permits
- Rates of forfeiture of permits
- Expected land capital costs per acre of forfeited permit
- Expected water capital costs per acre of forfeited permit
- Expected ongoing water treatment costs as a percent of water capital cost
- Administration costs

Forfeiture Rates and Release Rates

Using the full data on the number of permits issued, released, and forfeited, we examined the experience rates of forfeiture and release. The data was collated by years since issuance. Since 1977, over 5,600 permits have been issued, of which 1,912 were still in force as of the end of 2004. Table 1.1 shows a summary of the data.

Table 1.1 -- Permit Data

Year Issued	Number of Permits Issued	Number Still in Force as of June 2005	Percent Still In Force
1977	230	13	6%
1978	224	25	11%
1979	196	39	20%
1980	301	75	25%
1981	407	132	32%
1982	475	95	20%
1983	656	163	25%
1984	283	55	19%
1985	276	63	23%
1986	286	62	22%
1987	355	73	21%
1988	339	69	20%
1989	254	89	35%
1990	119	41	34%
1991	133	61	46%
1992	141	66	47%
1993	130	71	55%

Table 1.1 -- Permit Data			
Year Issued	**Number of Permits Issued**	**Number Still in Force as of June 2005**	**Percent Still In Force**
1994	123	83	67%
1995	92	75	82%
1996	99	82	83%
1997	103	89	86%
1998	66	54	82%
1999	48	42	88%
2000	59	57	97%
2001	61	60	98%
2002	58	58	100%
2003	68	68	100%
2004	52	52	100%
Total	**5,634**	**1,912**	**34%**

Chart 1.1

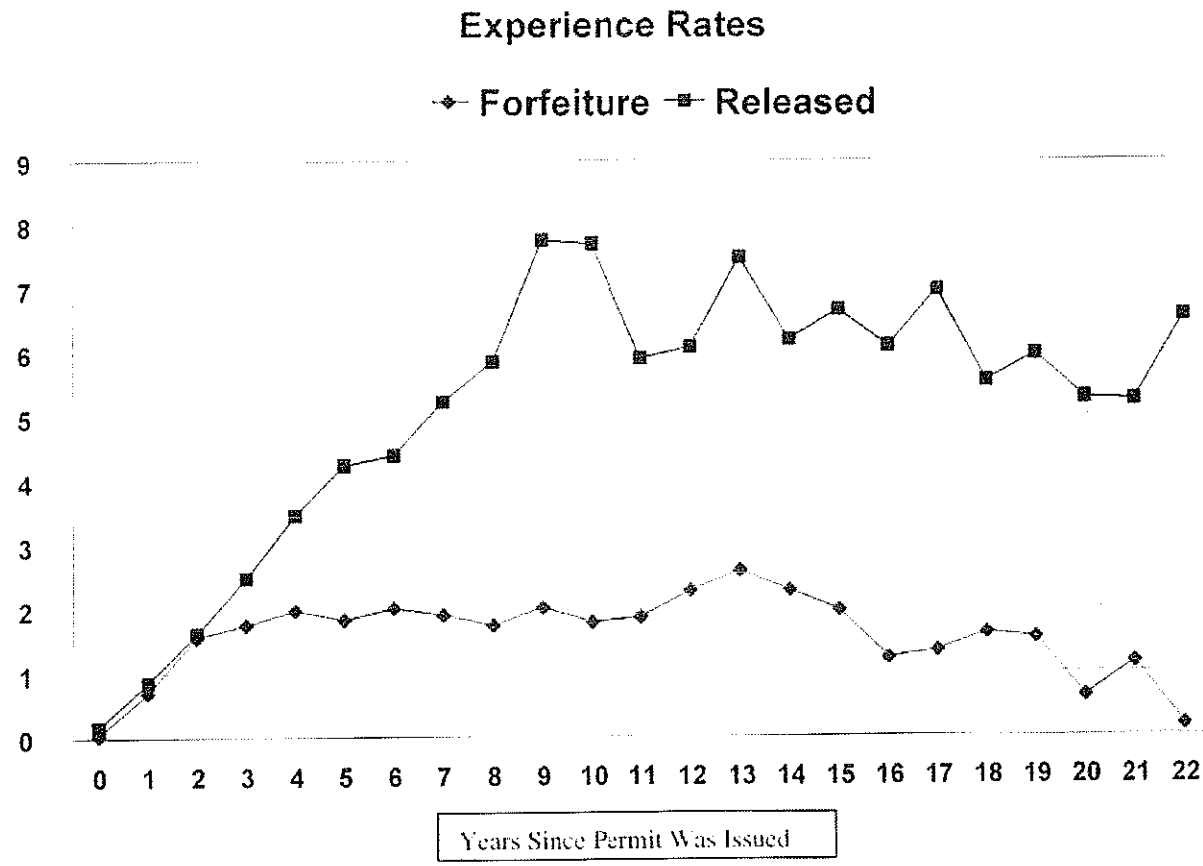


Chart 1.1 shows the raw experience rates by years since issuance. For each year since issuance, the experience rate is the ratio of the number forfeited or released in the year since issuance to the number in force at the beginning of the year. Chart 1.1 shows the rate of release increases steadily with duration since issuance and peaks at around 5 to 8 percent. The rate of forfeiture also increases with duration since issuance but levels off sooner at a rate of 2 to 3 percent and remains stable at this rate for over 10 years. The fluctuations in rates for years 10 and greater since issuance are primarily due to a paucity of data. We therefore applied a common actuarial smoothing approach to the data.

Chart 1.2

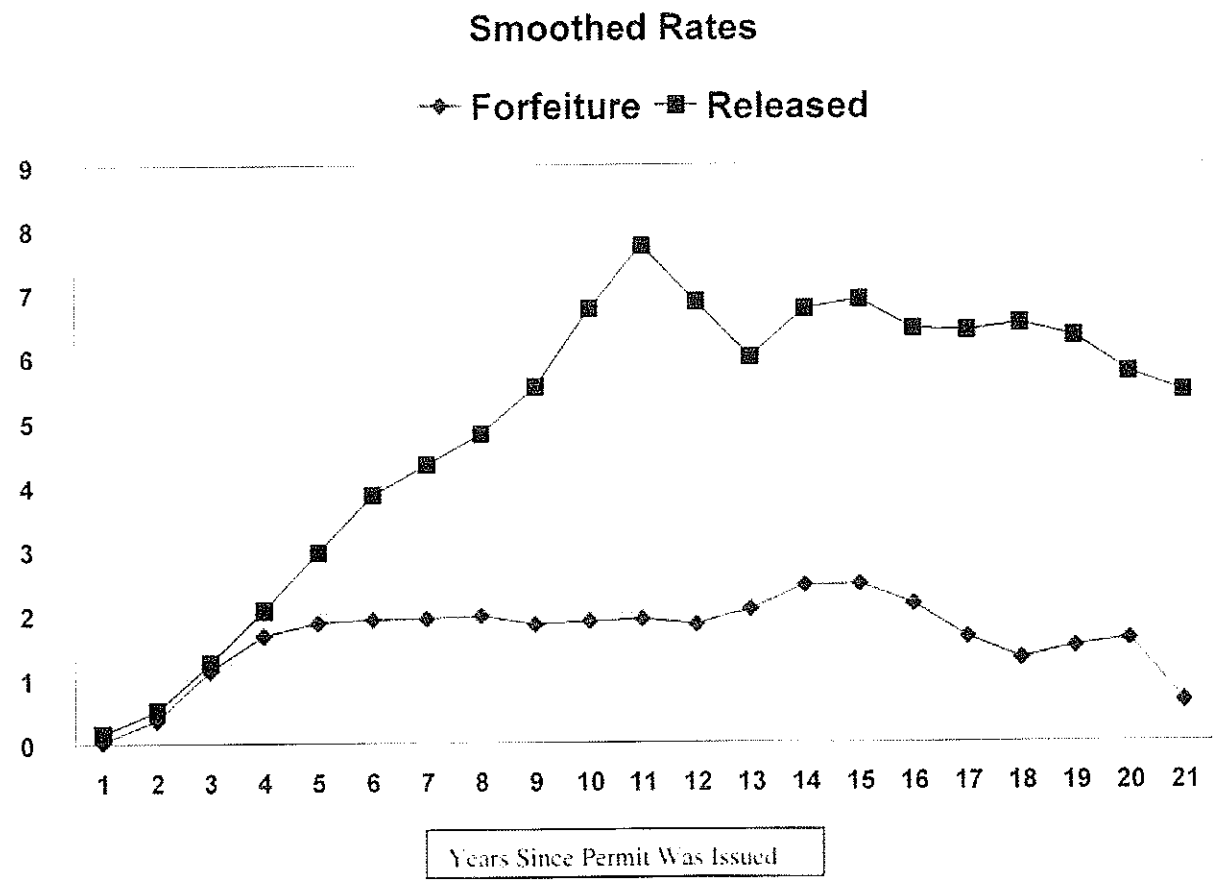


Chart 1.2 shows the smoothed rates. As the permitting process has undergone several changes over the last 20 years, we also examined the rates by cohorts to determine if a single set of rates would be appropriate or if separate rates were needed for different cohorts of permits

Chart 1.3 - Cumulative Forfeiture Rates by Permitting Period

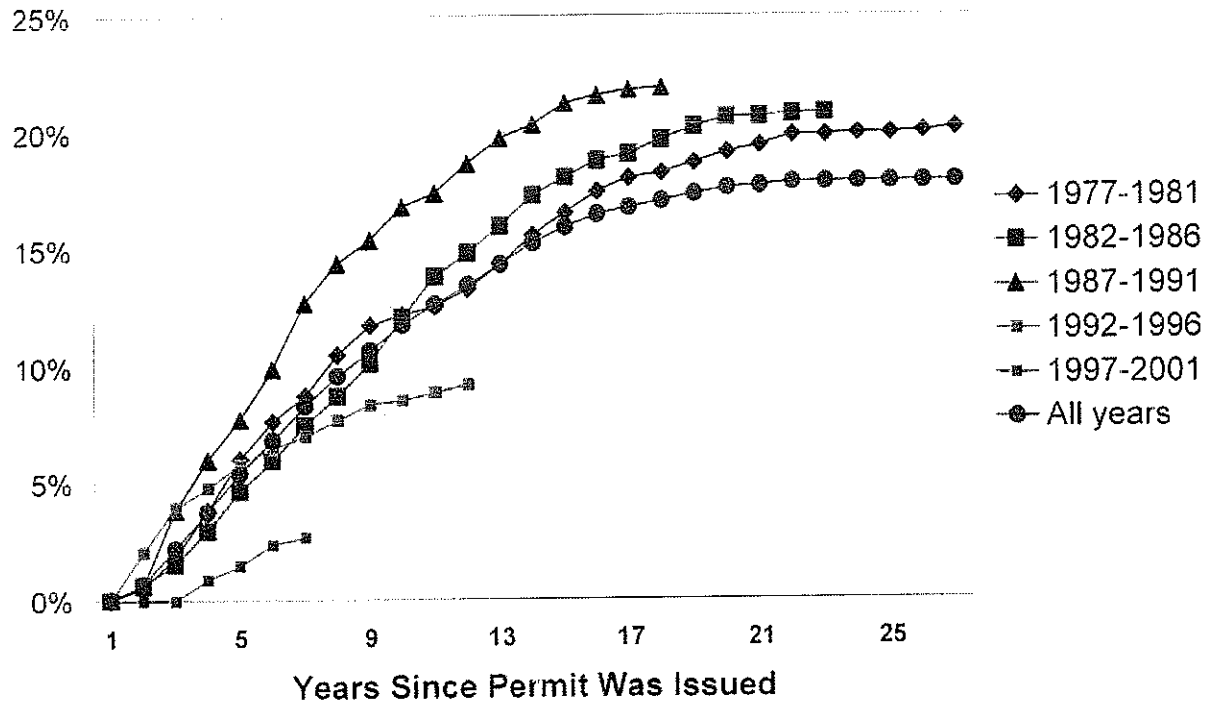


Chart 1.3 shows the experience forfeiture rates in 5-year cohorts. The numerator is the total number of permits that have been forfeited through the year since issuance, and the denominator is the total number of permits issued in the 5-year cohort. This shows that about 20 percent of permits that are issued are eventually forfeited. Further, the analysis shows that half of the forfeitures occur 10 or more years after issuance, so a duration-based set of rates is called for.

Of particular note is the emerging experience for the latest cohort of 1997-2001 issued permits. This analysis shows a substantially lower rate of forfeiture in the early years compared to the experience of the permits issued before 1991.

Chart 1.4 -- Cumulative Release Rates by Years Since Issuance

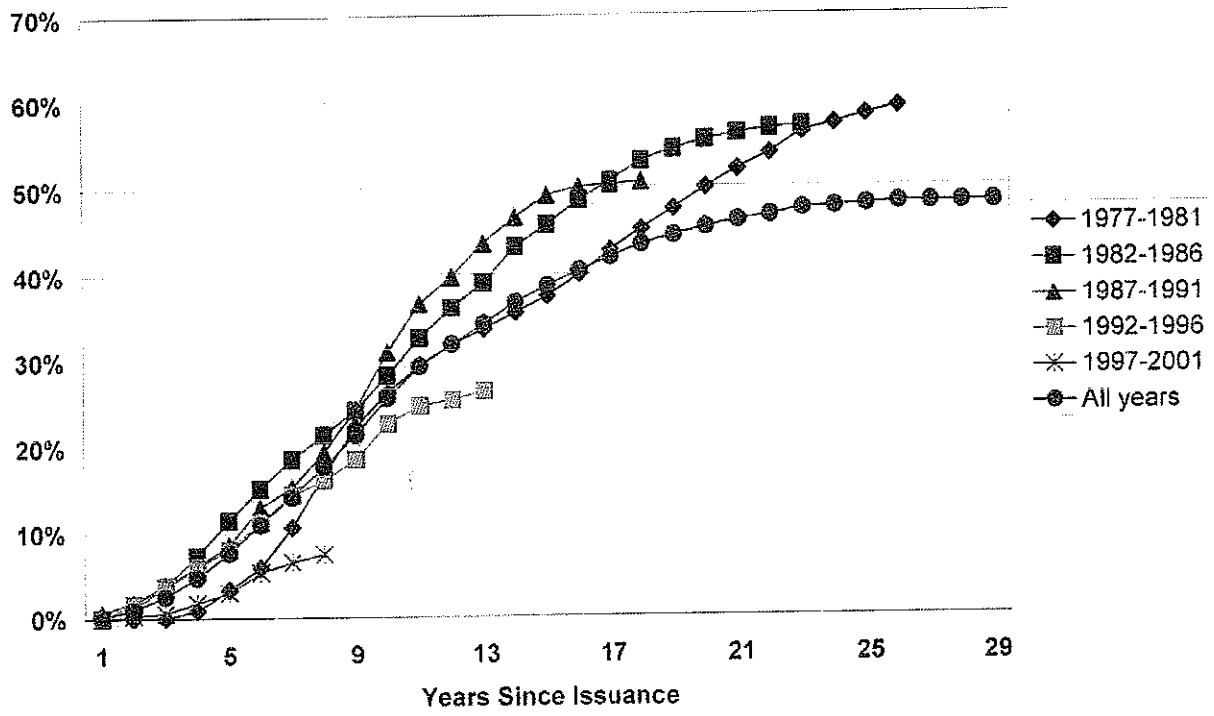


Chart 1.4 shows the cumulative release rates in 5-year cohorts. The numerator is the total number of permits that have been released for each 5-year cohort through the year since issuance and the denominator is the total number of permits issued in the 5-year cohort. The chart shows that 20 years after issuance about 50 percent of permits have been released. The chart shows a fairly consistent pattern of release rates by years since issuance, with emerging experience of slightly lower rates in the early years.

Based on the observations in Charts 1.3 and 1.4, we then pooled the data into two cohorts: permits issued prior to 1992 (i.e., for 1991 and prior) and permits issued after 1991.

Chart 1.5

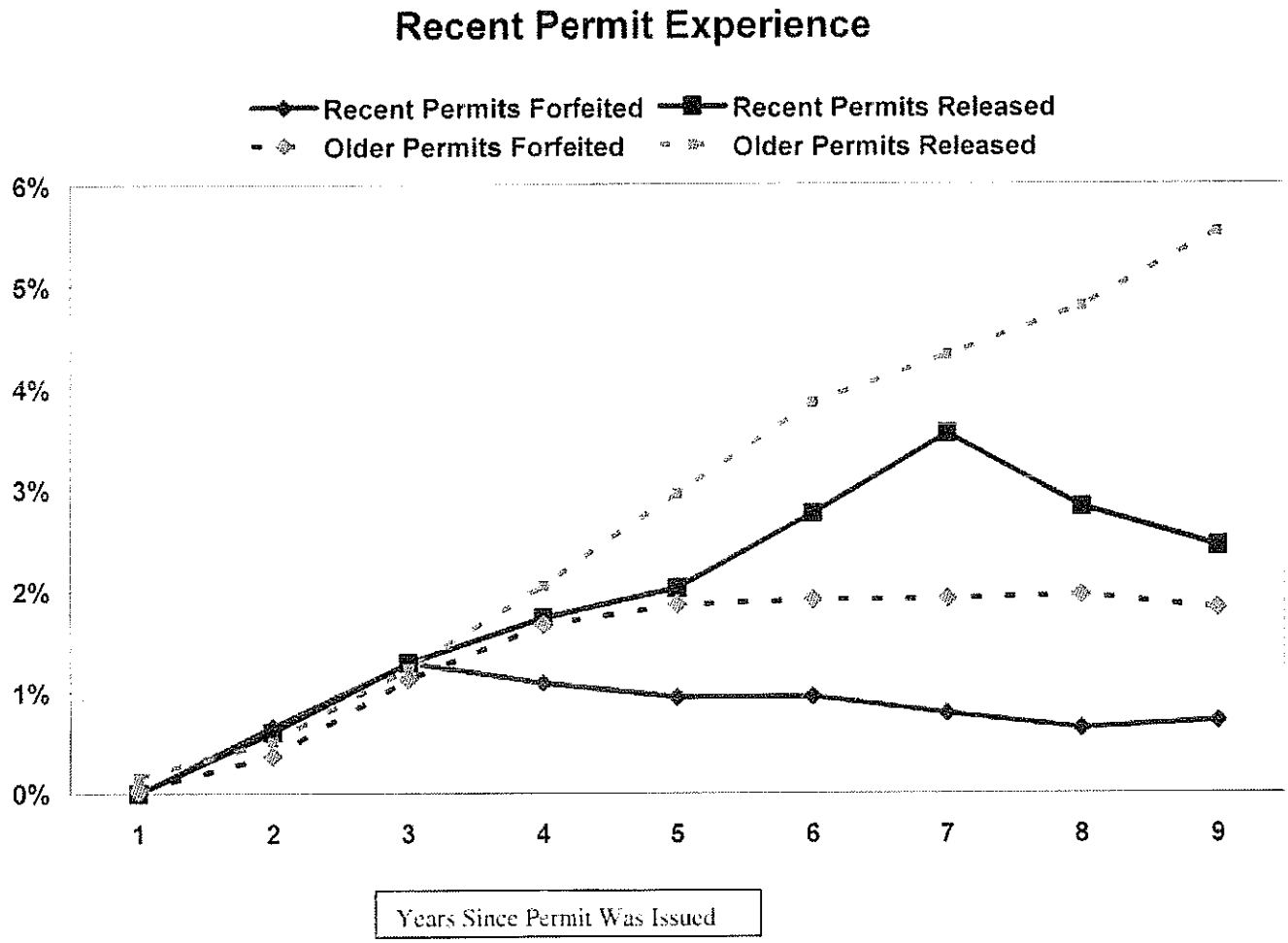


Chart 1.5 compares the emerging experience in the first 9 years since issuance of a permit. This chart shows that the rate of forfeiture for periods 5 years after issuance of recently issued permits (those issued since 1991) is about half the rate of the experience of those permits issued prior to 1992. The rate of release for recently issued permits is also lower than the rate for older permits.

Based on these observations we developed two sets of rates for the valuation. The first set provides the expected rate of release and forfeiture for permits issued prior to 1992. The second set is for permits issued after 1991.

Table 1.2 shows the valuation assumptions for the rates of forfeiture and release by year of issuance and years since issuance

Table 1.2 -- Valuation Rates of Forfeiture and Release of Permit				
Years Since Issuance	Permits Issued Before 1992		Permits Issued After 1991	
	Forfeiture	Release	Forfeiture	Release
1			0.05%	0.15%
2			0.65%	0.60%
3			1.30%	1.30%
4			1.10%	1.75%
5			1.00%	2.00%
6			1.00%	2.75%
7			0.75%	3.50%
8			0.75%	3.00%
9			0.75%	3.00%
10			0.75%	3.00%
11			0.75%	3.00%
12			0.75%	3.00%
13	2.00%	6.00%	0.75%	3.00%
14	2.00%	6.00%	0.75%	3.00%
15	2.00%	6.00%	0.75%	3.00%
16	2.00%	6.00%	0.75%	3.00%
17	1.50%	6.00%	0.75%	3.00%
18	1.50%	6.00%	0.75%	3.00%
19	1.50%	6.00%	0.75%	3.00%
20	1.50%	6.00%	0.75%	3.00%
Over 20	1.50%	6.00%	0.75%	3.00%

We applied these rates to the in-force permits and compared the expected bond forfeiture, civil penalties and court settlement receipts with the actual receipts over the past few years.

Table 1.3 summarizes the bond forfeitures, civil penalties, and court settlements reported for the last 4 fiscal years. FY2005 amounts are unaudited and may only include 11 months data.

Table 1.3 – Revenues from Bond Forfeitures, Civil Penalties, and Court Settlements				
	FY 2005	FY 2004	FY 2003	FY 2002
Bond Forfeitures	$321,000	$1,354,000	$401,000	$1,509,000
Civil Penalties	1,248,000	1,592,000	955,000	1,345,000
Other, including Court Settlements	1,557,000	375,000	518,000	1,322,000
TOTAL	$3,126,000	$3,321,000	$1,874,000	$4,176,000

Applying the forfeiture rates to permits of all bond sizes produced an expected level of receipts significantly higher than the recent experience. We therefore introduced weights to the forfeiture rates depending on the size of the bond. This resulted in forfeiture rates that were higher for smaller bonded amounts ($10,000 or less) and lower for larger amounts ($100,000 or more). In addition, these weighting factors produced expected revenues in line with the most recent experience.

Table 1.4 – Weighting Factors by Size of Bond	
Bond Size	Weighting
$10,000 and smaller	250%
Over $10,000 and under $100,000	100%
$100,000 and larger	38%

Land Reclamation Costs

We performed an analysis of the land capital expenditures for the over 1,800 permits that have been forfeited.

Table 1.5 summarizes the data and shows the development of the 2005 land capital costs per acre of permitted land.

Table 1.5 – Land Capital Expenditure Per Acre	
1. Total expenditure in actual dollars	$98,573,833
2. Total disturbed acreage under permit	36,551
3. Average cost per acre (1. / 2.) in actual dollars	$2,697
4. Mid-point of experience data	1992
5. Average annual increase in land capital expenditures over experience period	5.8 %
6. Increase factor (1.058)^13	2.08
7. Average cost per acre in 2005 dollars (3. x 6.)	$5,613

Each permit in the database had an associated status. We grouped the statuses into three categories: active, inactive, and phased release. Permits that have already entered a phased release state were deemed less likely to be forfeited than those in active or inactive status. However, as a single mine operator may hold permits in all three statuses, even some permits in phased release status may be forfeited due to enterprise risk rather than reclamation cost risk. We therefore applied a factor to each

permit based on these categories that reflected variations in the magnitude of potential liability. Table 1.6 shows these status factors.

Table 1.6 – Adjustment Factors for Permit Status	
Status	Liability Factor
Active	100%
Inactive	75%
Phased Release	50%

Source: Developed in consultation with SRFAC input.

Water Reclamation Costs

Table 1.7 summarizes the data on water capital expenditures and shows the development of the water capital expenditures as a percent of land capital expenditures.

Table 1.7 – Water Capital Expenditure Per Acre	
1. Total expenditure in actual dollars for open and closed water capital expenditure cases	$16,220,384
2. Total number of acres under permits	36,551
3. Cost per acre in actual dollars	$444
4. Mid-point of experience data	2002
5. Assumed annual increase in water capital expenditures over experience period	3 %
6. Increase factor (1.03)^3	1.09
7. Average cost per acre (3 x 6.)	$485
8. Water Capital Expenditure as a percent of Land Capital Expenditure (7 / Table 1.5 Item 7.)	9%

Water Treatment Costs

Table 1.8 summarizes the data on water treatment costs and shows the development of the annual water treatment costs as a percent of the water capital costs.

Table 1.8 – Water Treatment Costs	
1. Total capital expenditure in actual dollars for closed water capital expenditure cases	$11,824,589
2. Total number of permits	58
3. Average capital expenditure cost per closed case (1./2.)	$203,872
4. Total water treatment costs for closed water capital expenditure cases	$20,127,693
5. Total days from water capital construction completion to 7/31/05 for closed water capital expenditure cases	120,429
6. Average annualized Water Treatment Costs for closed water capital expenditure cases (4. / (5. / 365))	$61,004
7. Water Treatment Costs as a percent of Water Capital Expenditure (6. / 3.)	30%

Administration Costs

Generally, the administration costs are independent of the cost of the reclamation activities. The DEP staffing levels may be adjusted over time as the legacy of older permit forfeitures is processed. For valuation purposes, we have assumed the current staffing levels will remain unchanged. Future administration costs were estimated by increasing the current costs by 3 percent per year, reflecting the anticipated level of aggregate pay increases.

ACTUARIAL VALUATION

The actuarial model builds on the current cash projections developed by the DEP for the expected reclamation costs on sites where permits have already been forfeited.

Land Capital Expenditures

Table 1.9 shows the expected land capital expenditures for:

- Permits forfeited prior to July 1, 2001
- Permits forfeited after July 1, 2001 and before June 30, 2005
- Future forfeited permits that were issued before July 1, 2005, and
- Total of the above

Table 1.9 Land Capital Expenditures				
Fiscal Year Ending	Forfeited <7/1/2001	Forfeited >7/1/2001	Future Forfeited Permits	Total
30-Jun-05				
30-Jun-06	$2,413,480	$403,056		$2,816,536
30-Jun-07	$4,022,620	$3,716,873		$7,739,493
30-Jun-08	$14,259,688	$4,464,861		$18,724,549
30-Jun-09	$288,622	$1,926,810		$2,215,432
30-Jun-10			$10,034,329	$10,034,329
30-Jun-11			$9,612,311	$9,612,311
30-Jun-12			$9,052,549	$9,052,549
30-Jun-13			$8,501,275	$8,501,275
30-Jun-14			$7,894,950	$7,894,950
30-Jun-15			$7,484,900	$7,484,900
30-Jun-16			$7,190,602	$7,190,602
30-Jun-17			$6,903,097	$6,903,097
30-Jun-18			$6,624,457	$6,624,457
30-Jun-19			$6,356,877	$6,356,877
30-Jun-20			$6,100,388	$6,100,388
30-Jun-21			$5,854,501	$5,854,501
30-Jun-22			$5,618,780	$5,618,780
30-Jun-23			$5,392,787	$5,392,787
30-Jun-24			$5,176,097	$5,176,097
30-Jun-25			$4,968,329	$4,968,329
30-Jun-26			$4,769,093	$4,769,093

Source: Data from columns 2 & 3 taken from DEP June 2005 cash flow report.

Water Capital Expenditures

Table 1.10 shows the expected water capital expenditures for:

- Permits forfeited prior to July 1, 2001
- Permits forfeited after July 1, 2001 and before June 30, 2005
- Future forfeited permits that were issued before July 1, 2005, and
- Total of the above

Table 1.10 Water Capital Expenditures				
Fiscal Year Ending	Forfeited <7/1/2001	Forfeited >7/1/2001	Future Forfeited Permits	Total
30-Jun-05				
30-Jun-06	$7,024,422	$0		$7,024,422
30-Jun-07	$4,020,027	$518,256		$4,538,283
30-Jun-08	$3,249,720	$318,600		$3,568,320

Table 1.10 Water Capital Expenditures				
Fiscal Year Ending	Forfeited <7/1/2001	Forfeited >7/1/2001	Future Forfeited Permits	Total
30-Jun-09	$344,088			$ 344,088
30-Jun-10			$1,605,493	$1,605,493
30-Jun-11			$1,537,970	$1,537,970
30-Jun-12			$1,448,408	$1,448,408
30-Jun-13			$1,360,204	$1,360,204
30-Jun-14			$1,263,192	$1,263,192
30-Jun-15			$1,197,584	$1,197,584
30-Jun-16			$1,150,496	$1,150,496
30-Jun-17			$1,104,496	$1,104,496
30-Jun-18			$1,059,913	$1,059,913
30-Jun-19			$1,017,100	$1,017,100
30-Jun-20			$976,062	$976,062
30-Jun-21			$936,720	$936,720
30-Jun-22			$899,005	$899,005
30-Jun-23			$862,846	$862,846
30-Jun-24			$828,175	$828,175
30-Jun-25			$794,933	$794,933
30-Jun-26			$763,055	$763,055

Ongoing Water Treatment

Table 1.11 shows the ongoing water treatment costs for:

- Permits forfeited prior to July 1, 2001
- Permits forfeited after July 1, 2001 and before June 30, 2005
- Future forfeited permits that were issued before July 1, 2005, and
- Total of the above

Table 1.11 – Ongoing Water Treatment Costs				
Fiscal Year Ending	Permits Forfeited <7/1/2001	Active in Perpetuity	Future Forfeited Permits	Total Water Quality
30-Jun-06	$361,639	$ 1,680,000	$0	$ 2,041,639
30-Jun-07	$536,155	$ 1,680,000	$0	$2,216,155
30-Jun-08	$777,351	$ 1,680,000	$0	$2,457,351

Table 1.11 – Ongoing Water Treatment Costs				
Fiscal Year Ending	Permits Forfeited <7/1/2001	Active in Perpetuity	Future Forfeited Permits	Total Water Quality
30-Jun-09	$902,204	$ 1,680,000	$0	$2,582,204
30-Jun-10	$929,270	$ 1,680,000	$481,648	$3,090,918
30-Jun-11	$929,270	$ 1,680,000	$943,039	$3,552,309
30-Jun-12	$929,270	$ 1,680,000	$1,377,561	$3,986,831
30-Jun-13	$929,270	$ 1,680,000	$1,785,622	$4,394,892
30-Jun-14	$929,270	$ 1,680,000	$2,164,580	$4,773,850
30-Jun-15	$929,270	$ 1,680,000	$2,523,855	$5,133,125
30-Jun-16	$929,270	$ 1,680,000	$2,869,004	$5,478,274
30-Jun-17	$929,270	$ 1,680,000	$3,200,353	$5,809,623
30-Jun-18	$929,270	$ 1,680,000	$3,518,327	$6,127,597
30-Jun-19	$929,270	$ 1,680,000	$3,823,457	$6,432,727
30-Jun-20	$929,270	$ 1,680,000	$4,116,275	$6,725,545
30-Jun-21	$929,270	$ 1,680,000	$4,397,291	$7,006,561
30-Jun-22	$929,270	$ 1,680,000	$4,666,993	$7,276,263
30-Jun-23	$929,270	$ 1,680,000	$4,925,847	$7,535,117
30-Jun-24	$929,270	$ 1,680,000	$5,174,299	$7,783,569
30-Jun-25	$929,270	$ 1,680,000	$5,412,779	$8,022,049
30-Jun-26	$929,270	$ 1,680,000	$5,641,696	$8,250,966

Administration Costs

Table 1.12 shows the projected administration costs over the next 20 years.

Table 1.12 – Administration Costs	
Fiscal Year Ending	Administration Costs
30-Jun-06	$ 2,624,766
30-Jun-07	$ 2,703,508
30-Jun-08	$ 2,784,614
30-Jun-09	$ 2,868,152
30-Jun-10	$ 2,954,197
30-Jun-11	$ 3,042,823
30-Jun-12	$ 3,134,107
30-Jun-13	$ 3,228,130
30-Jun-14	$ 3,324,974

Table 1.12 – Administration Costs		
Fiscal Year Ending	Administration Costs	
30-Jun-15	$	3,424,724
30-Jun-16	$	3,527,465
30-Jun-17	$	3,633,289
30-Jun-18	$	3,742,288
30-Jun-19	$	3,854,557
30-Jun-20	$	3,970,193
30-Jun-21	$	4,089,299
30-Jun-22	$	4,211,978
30-Jun-23	$	4,338,337
30-Jun-24	$	4,468,488
30-Jun-25	$	4,602,542
30-Jun-26	$	4,740,618

Coal Tax Revenues

Table 1.13 shows the projected coal production from the Consensus Forecast and the estimated coal production from active acres associated with the projected permits remaining in force. The tonnage from active acreage was determined as the consensus forecast tonnage in each year multiplied the ratio of active acreage in the beginning of each year to the active acreage at the beginning of fiscal year 2006.[2]

Table 1.13 – Projected Coal Production from Actively Operated Sites			
Fiscal Year	*Consensus Forecast*	*Active Acreage (Beginning of Fiscal year)*	*Tonnage from Active Acreage*
2006	140,350,000	226,352	140,350,000
2007	139,500,000	214,255	132,044,672
2008	139,050,000	202,361	124,312,147
2009	139,250,000	190,777	117,364,574
2010	137,600,000	179,574	109,163,577
2011	135,050,000	168,855	100,745,218
2012	133,550,000	158,621	93,588,087
2013	131,500,000	148,869	86,486,056
2014	131,100,000	139,662	80,890,421
2015	131,800,000	131,042	76,303,094
2016	130,550,000	122,985	70,932,511
2017	131,200,000	115,453	66,919,928

[2] Example: Tonnage from active acreage in 2011 = 135,050,000 x (168,855 226,352) = 100,745,218

Table 1.13 – Projected Coal Production from Actively Operated Sites			
Fiscal Year	*Consensus Forecast*	*Active Acreage (Beginning of Fiscal year)*	*Tonnage from Active Acreage*
2018	133,900,000	108,412	64,131,949
2019	137,200,000	101,831	61,723,527
2020	141,150,000	95,679	59,664,256
2021	144,250,000	89,928	57,309,629
2022	146,350,000	84,552	54,668,049
2023	147,650,000	79,525	51,874,536
2024	148,450,000	74,826	49,073,831
2025	148,950,000	70,433	46,348,328
2026	149,200,000	66,326	43,718,994

Table 1.14 Coal Production and Tax Revenues				
Fiscal Year	Coal Production Tons	Permanent 7 cent Tax	Temporary 7 cent Tax	Total Tax Revenues
2006	140,350,000	$ 9,628,010	$ 9,628,010	$ 19,256,020
2007	132,044,672	$ 9,058,264	$ 2,264,566	$ 11,322,830
2008	124,312,147	$ 8,527,811		$ 8,527,811
2009	117,364,574	$ 8,051,207		$ 8,051,207
2010	109,163,577	$ 7,488,618		$ 7,488,618
2011	100,745,218	$ 6,911,118		$ 6,911,118
2012	93,588,087	$ 6,420,138		$ 6,420,138
2013	86,486,056	$ 5,932,938		$ 5,932,938
2014	80,890,421	$ 5,549,077		$ 5,549,077
2015	76,303,094	$ 5,234,385		$ 5,234,385
2016	70,932,511	$ 4,865,963		$ 4,865,963
2017	66,919,928	$ 4,590,699		$ 4,590,699
2018	64,131,949	$ 4,399,443		$ 4,399,443
2019	61,723,527	$ 4,234,225		$ 4,234,225
2020	59,664,256	$ 4,092,958		$ 4,092,958
2021	57,309,629	$ 3,931,430		$ 3,931,430
2022	54,668,049	$ 3,750,217		$ 3,750,217
2023	51,874,536	$ 3,558,581		$ 3,558,581
2024	49,073,831	$ 3,366,453		$ 3,366,453
2025	46,348,328	$ 3,179,483		$ 3,179,483

Source: Coal Production Consensus Forecast. Fiscal Year data determined as one half of calendar year data in which fiscal year begins and one half of calendar year data in which fiscal year ends.

Bond Forfeiture, Civil Penalties, and Court Settlements

Table 1.15 shows the projected revenues from bond forfeitures, civil penalties, and court settlements.

Table 1.15 – Revenues from Bond Forfeitures, Civil Penalties, and Court Settlements

Fiscal Year Ending	Expected Revenue
30-Jun-06	$3,321,102
30-Jun-07	$3,139,592
30-Jun-08	$2,864,955
30-Jun-09	$2,624,107
30-Jun-10	$2,373,970
30-Jun-11	$2,182,348
30-Jun-12	$2,040,741
30-Jun-13	$1,907,268
30-Jun-14	$1,782,039
30-Jun-15	$1,665,001
30-Jun-16	$1,555,668
30-Jun-17	$1,453,533
30-Jun-18	$1,358,119
30-Jun-19	$1,268,984
30-Jun-20	$1,185,713
30-Jun-21	$1,107,919
30-Jun-22	$1,035,242
30-Jun-23	$967,343
30-Jun-24	$903,909
30-Jun-25	$844,642

Investment Income

The investment income is estimated assuming a 2.5% net investment rate on the fund balance at the beginning of the year. As the SRF is prohibited from borrowing, when the projected fund balance is zero, there is no investment income in the following year.

Permit Projections

Table 1.16 shows the projected number of permits. Separate projections were made of active and inactive permits as well as permits in phased release. Of the almost 1,900 permits in force as of July 1, 2005, over half are projected to still be in force after 10 years.

Table 1.16 – Projection of Number of Permits In Force

Fiscal Year	Active	Inactive	Phased Release	Total
2005	1,218	231	440	1,889
2006	1,144	215	408	1,767
2007	1,072	201	378	1,650
2008	1,004	187	350	1,540
2009	938	174	324	1,436
2010	876	162	300	1,337
2011	817	150	278	1,245
2012	762	140	257	1,159
2013	710	130	239	1,078
2014	662	121	221	1,003
2015	616	112	205	934
2016	574	105	190	869
2017	535	97	176	808
2018	499	91	163	752
2019	465	84	151	700
2020	433	78	140	651
2021	404	73	130	606
2022	376	68	120	564
2023	351	63	111	525
2024	327	59	103	488
2025	304	55	96	455

Table 1.17 shows the projection of the acreage of permits in force. Of the almost 300,000 of acreage in force as of July 1, 2005, over 50 percent are projected to be in force after 10 years.

Table 1.17 – Projection of Acreage of Permits In Force

Fiscal Year	Active	Inactive	Phased Release	Total
2005	226,352	20,615	47,541	294,508
2006	214,255	19,312	44,179	277,746
2007	202,361	18,074	41,043	261,478

Table 1.17 – Projection of Acreage of Permits In Force				
Fiscal Year	Active	Inactive	Phased Release	Total
2008	190,777	16,908	38,134	245,819
2009	179,574	15,805	35,439	230,818
2010	168,855	14,764	32,938	216,557
2011	158,621	13,791	30,617	203,029
2012	148,869	12,882	28,460	190,211
2013	139,662	12,032	26,456	178,150
2014	131,042	11,239	24,594	166,875
2015	122,985	10,499	22,863	156,347
2016	115,453	9,807	21,255	146,515
2017	108,412	9,161	19,761	137,334
2018	101,831	8,557	18,372	128,760
2019	95,679	7,994	17,082	120,755
2020	89,928	7,467	15,883	113,278
2021	84,552	6,976	14,769	106,297
2022	79,525	6,517	13,733	99,775
2023	74,826	6,088	12,770	93,684
2024	70,433	5,688	11,875	87,996
2025	66,326	5,314	11,043	82,683

Table 1.18 shows the projected acreage of in-force permits, forfeited permits, and released permits for the next 20 years.

Table 1.18 – Projection of Acreage for In-Force permits, Forfeited Permits, and Released Permits				
Fiscal Year	Acreage of In Force Permits	Acreage of Forfeited Permits	Acreage of Released Permits	End of Year In Force Acreage
2005	294,508	1,958	14,804	277,746
2006	277,746	1,821	14,447	261,478
2007	261,478	1,663	13,996	245,819
2008	245,819	1,515	13,486	230,818
2009	230,818	1,370	12,891	216,557
2010	216,557	1,260	12,268	203,029
2011	203,029	1,175	11,643	190,211
2012	190,211	1,094	10,967	178,150
2013	178,150	1,019	10,256	166,875
2014	166,875	948	9,580	156,347

Table 1.18 – Projection of Acreage for In-Force permits, Forfeited Permits, and Released Permits

Fiscal Year	Acreage of In Force Permits	Acreage of Forfeited Permits	Acreage of Released Permits	End of Year In Force Acreage
2015	156,347	883	8,949	146,515
2016	146,515	823	8,358	137,334
2017	137,334	766	7,808	128,760
2018	128,760	713	7,292	120,755
2019	120,755	664	6,813	113,278
2020	113,278	617	6,364	106,297
2021	106,297	576	5,946	99,775
2022	99,775	537	5,554	93,684
2023	93,684	500	5,188	87,996
2024	87,996	465	4,848	82,683
2025	82,683	433	4,529	77,721

SECTION 2

DETERMINATION OF FUTURE FUNDING TO ENSURE SOLVENCY OF THE PROGRAM

In this section, we build on the valuation results in Section 1 to identify options for managing the program that will ensure solvency. The following charts and the information on which they are based only include revenues and expenditures for permits issued or forfeited prior to June 30, 2005.

Chart 2.1 shows the projected expenditures, revenues, and fund balance under current law that forms the basis for the valuation.

Chart 2.1

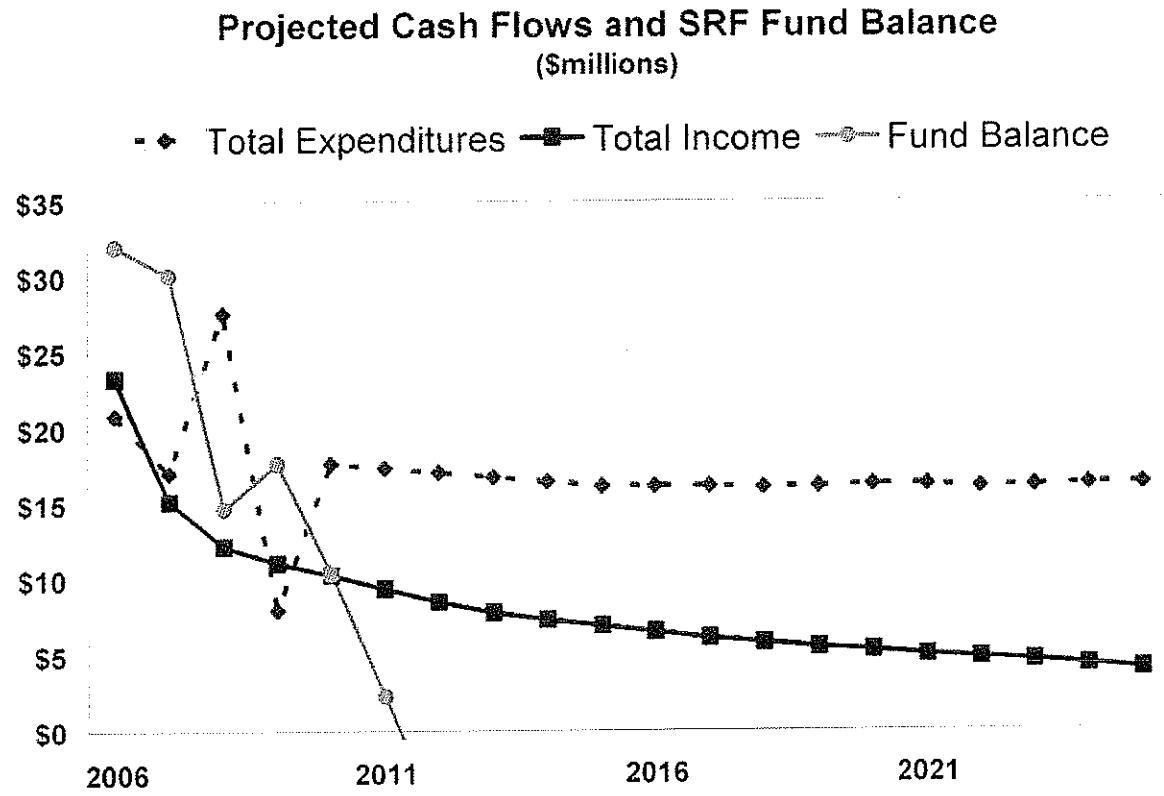
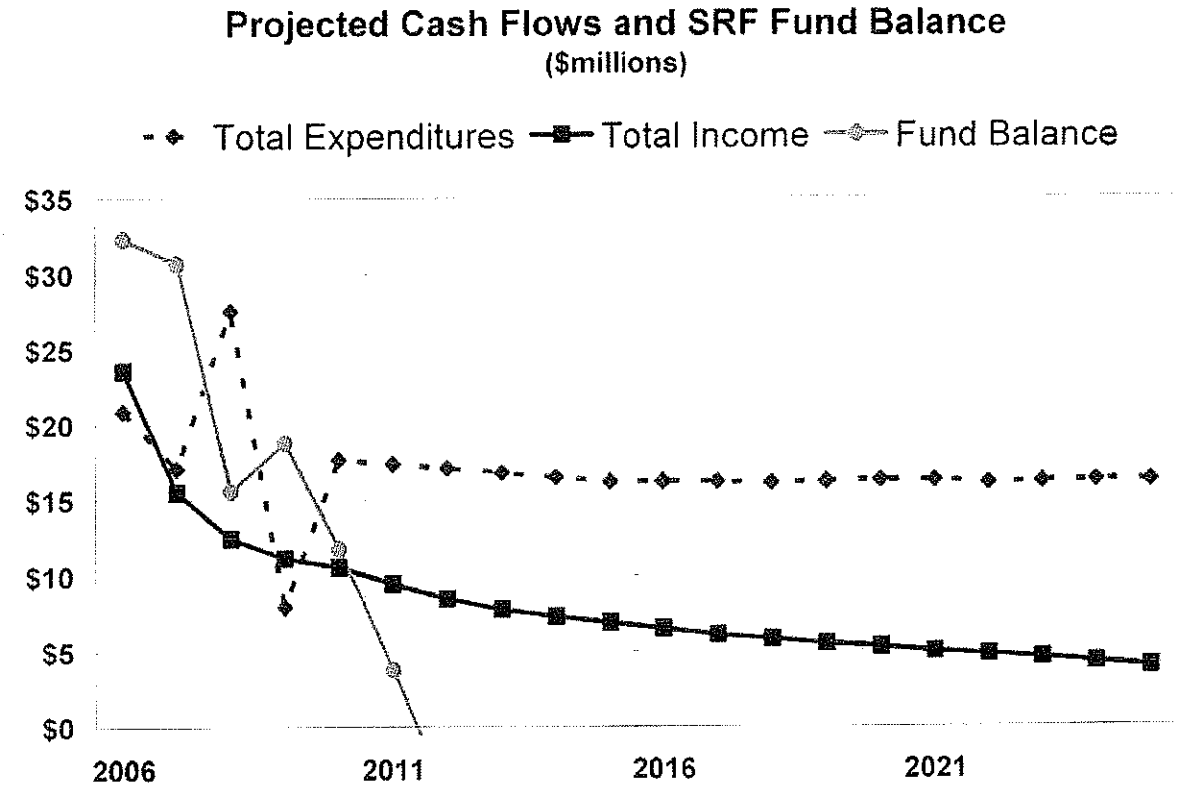


Chart 2.1 shows that after 2009, projected SRF expenditures are higher than projected income each year, resulting in a rapid decline in the fund balance, reaching zero in FY 2012. Note that the income includes projected coal tax revenues based on the consensus coal tax forecast multiplied by the ratio of projected active acreage in each year to the active acreage at the beginning of fiscal year 2006.

The first option we explored was to assess how changes in anticipated investment income would affect the SRF.

Chart 2.2 shows the projected cash flows and SRF fund balance if the SRF were able to earn 1 percent higher investment returns annually. Increasing the investment earnings by 1 percent has minimal impact on the SRF fund balance and only defers the date the SRF is exhausted by less than one year.

Chart 2.2



Note that the income includes projected coal tax revenues based on the consensus coal tax forecast multiplied by the ratio of projected active acreage in each year to the active acreage at the beginning of fiscal year 2006.

The second option we evaluated was how an additional coal tax after September 30, 2006 would impact the fund

Chart 2.3

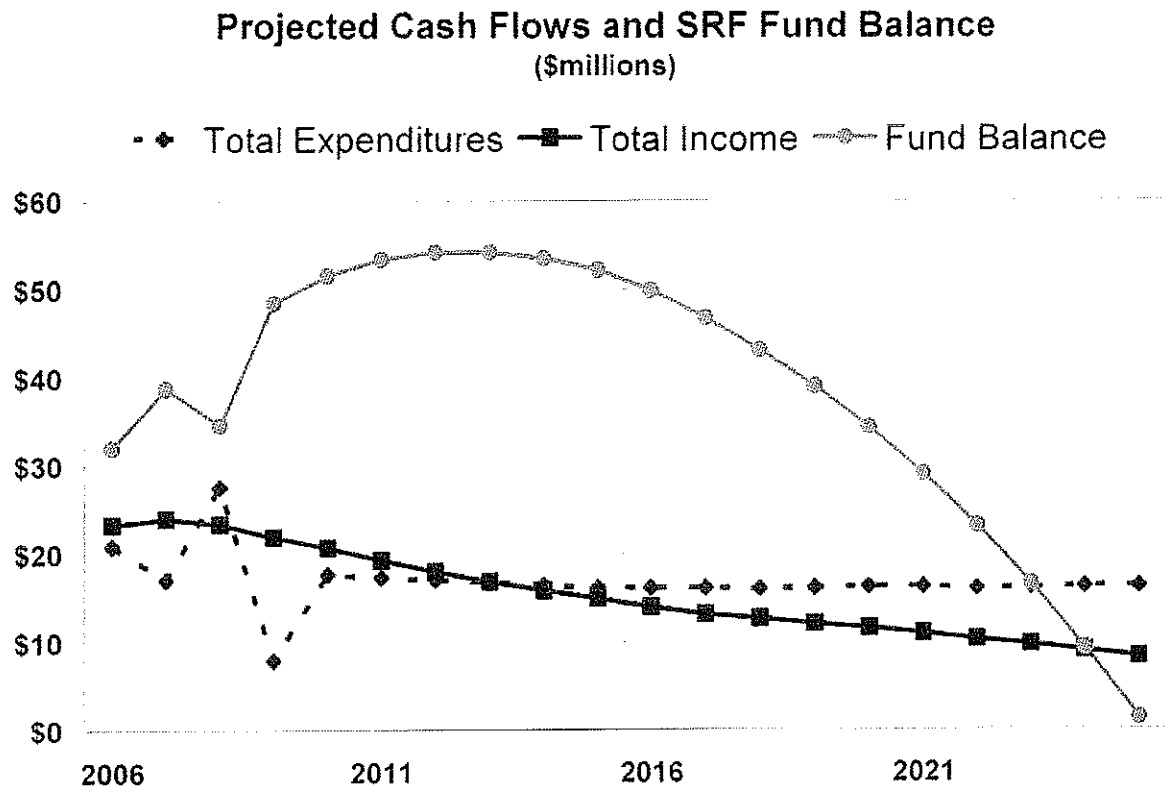


Chart 2.3 shows that an additional coal tax of 9 cents per ton, beginning October 1, 2006, produces sufficient additional income so that the Special Reclamation Fund is not exhausted in the next 20 years. Note that the income includes projected coal tax revenues based on the consensus coal tax forecast multiplied by the ratio of projected active acreage in each year to the active acreage at the beginning of fiscal year 2006.

Updated Bond Amounts

As the cost of reclamation activities increases over time due to general price inflation, it would be prudent to increase the bond amounts over time. Failure to do so results in the forfeited bond amounts covering a decreasing portion of the reclamation costs and creates a moral hazard.

Furthermore, if bond amounts were increased significantly, they may be used to fully fund the reclamation activities of newly issued permits that become forfeited. A full bonding analysis is outside the scope of this valuation, which is primarily focused on assessing the current liability for reclamation activities on active sites and expected forfeited permits that have already been issued.

As an indication of how inflation erodes the value of the bond forfeiture revenues in real terms, we have illustrated the effect that bond amounts have on the SRF by doubling the current amounts. Chart 2.4 shows the projected cash flows and SRF fund balance if all bond amounts currently in force were doubled effective July 1, 2005.

Chart 2.4

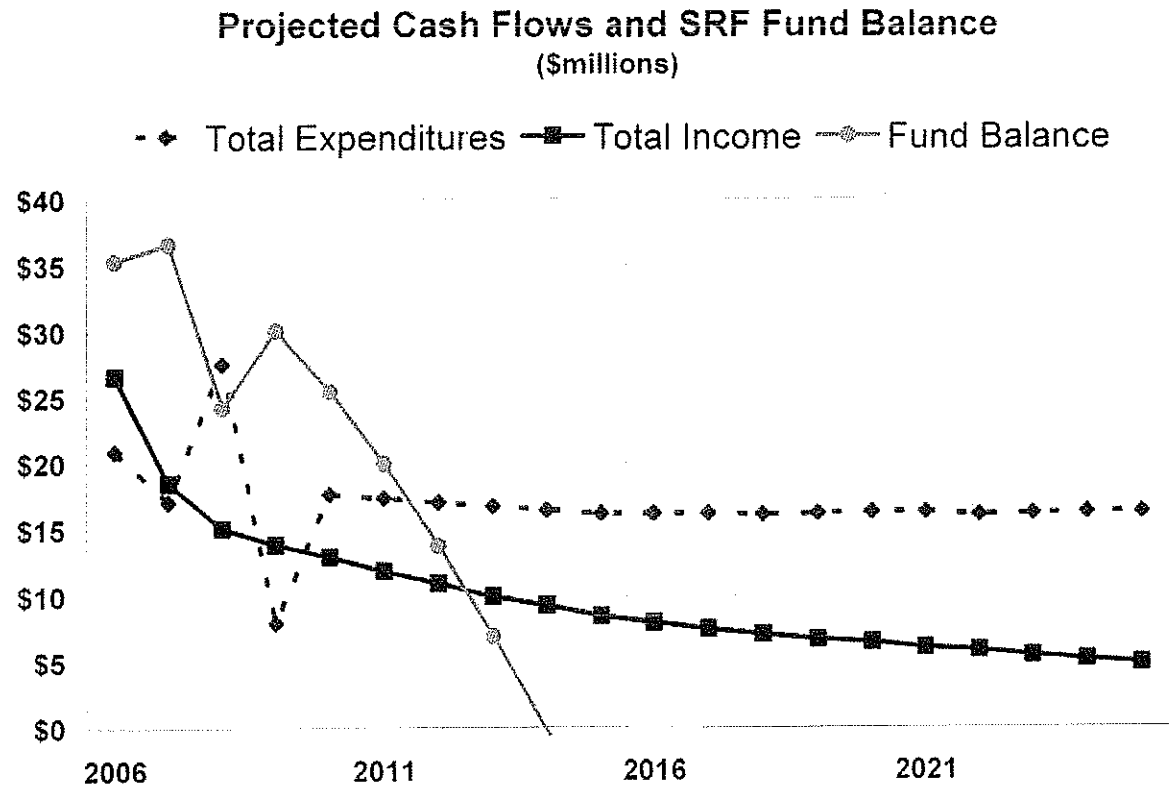


Chart 2.4 shows that if the SRF had issued bonding requirements at double the bond amounts currently in force, the time when the SRF is exhausted would be deferred by 2 years. This analysis assumes the rate of forfeitures would not change. Note that the income includes projected coal tax revenues based on the consensus coal tax forecast multiplied by the ratio of projected active acreage in each year to the active acreage at the beginning of fiscal year 2006.

SECTION 3

COMPARISON OF FUNDING MECHANISMS IN OTHER STATES

Need for Land Reclamation

Since passage of the Surface Mining Law in 1977, land reclamation has become a built-in component of coal mining. In fact, successfully reclaimed land quickly begins to resemble its natural condition and is difficult to distinguish from the surrounding landscape.

Both state and federal regulations require that a bond be posted as a condition of issuance of a permit to an operator. The bond is to ensure that the agency will have funds to reclaim the site in the event of permit revocation and bond forfeiture. Federal regulations recognize three major categories of reclamation bonds: corporate surety bonds, collateral bonds (cash; certificates of deposit; first-lien interests in real estate; letters of credit: federal, state, or municipal bonds; and investment-grade securities), and self bonds (legally binding corporate promises without separate surety or collateral, available only to permittees who meet certain financial tests). State programs generally recognize the same three categories, although the programs vary somewhat in terms of which financial instruments are acceptable.

West Virginia is a bond pool (Alternative Bonding System) state where a tax (currently 14 cents per ton) on coal production pays for any excess reclamation costs above what the bond for a particular site covers. The bond rate is set by rule and is $1,000 to $5,000 per acre, with a minimum per site of $10,000.

The bond is required until a finding that all reclamation has been successfully completed. Both state and federal regulations also set criteria for release of a bond upon completion of several phases:

- Phase I - backfilling and drainage control
- Phase II - revegetated according to standards and
- Phase III - meets all the standards of the approved plan.

Funding Land Reclamation

Mining, oil and gas companies that operate on federal lands are required by the federal government to restore that land to safe environmental conditions when they are finished. To do so the federal government requires the mining companies to demonstrate sufficient financial capacity, otherwise they are not allowed to operate.

Financial Instruments Used to Fulfill the Obligation

Mining companies use various financial instruments to fulfill the bond posting requirement by various states. Of the available financial instruments, states typically require surety bonds, corporate guarantees, and incrementally funded trusts. In addition to the above instruments, various states have their own bond pools. A mining company can enter such a pool if it meets the requirements and pays the appropriate dues.

Surety Bonds

In an attempt to demonstrate financial capacity, mining companies buy surety bonds. The surety company issues these bonds. These bonds are financial assurance instruments that hold funds or collateral in reserve. In the unlikely event that a mining company fails to perform the reclamation, the federal government claims the surety bond in an attempt to prevent the cost of reclamation being transferred to the public. The bond is held by the government and is released to the operator upon successful completion of the reclamation. If the costs have been accurately anticipated, surety bonds protect the public from bearing the cost of reclamation of the land in the event of default by the mining company.

There are 24 states that have taken the primary responsibility of the reclamation of land for coal mining. These states together hold about $2.5 billion in financial assurances for the reclamation of coalmines.

Due to the lack of profitability in the surety industry, many insurance providers have ceased issuing surety bonds. This has led to the development of shortage of surety bond issuers, and this shortage of supply has led to an increase in the price of the surety bonds. Various other alternatives that have been suggested and are being practiced in different states are the corporate guarantee, bond pool, and incrementally funded trusts.

Corporate Guarantees

A corporate guarantee is a general obligation of the firm. The federal government uses independent auditors to analyze the financial strength of the corporation involved in mining to determine if the corporation is financially stable to perform the reclamation of the mined land. Corporate guarantees are currently being accepted for offshore oil and gas drilling companies. Coal mining companies can use corporate guarantees under the Office of Surface Mining regulations for the surface mining only. Of the 24 states that have taken primary land reclamation responsibility, 20 states accept corporate guarantees as a form of financial solvency for reclamation. Currently the federal government is not accepting any more corporate guarantees, primarily due to bankruptcies and abandoned obligations for sites in Colorado.

Corporate guarantees are an attractive tool for the mining companies as they are a relatively inexpensive way of providing financial capacity. The company does not need to invest money in any bond or to purchase any coverage from a third party. It is, however, a risk for the government, because in case of a bankruptcy, the government is like any other lender and is subordinate to the claims, with senior debt having a higher priority. In such a circumstance the government might be

able to recover only a fraction of the cost associated with reclamation of land, or in some cases not recover any monies. For the state of Nevada about 50% of the financial assurance is held in the form of corporate guarantee.

Bond Pools

A bond pool is a fund into which a group of qualified mining operators pay fees to participate. The pool in return provides financial assurance for its participants. The qualified mining operators can begin operations after paying the joining fee and the ongoing fees. In addition, operators must make payments into the fund based on their reclamation obligations. The payment is assessed at a fixed fee, generally some amount per acre of land being mined or an amount per tonnage of coal being mined. The bond pool is not responsible for obligations exceeding the pool's resources. In such an event the additional cost of mine reclamation would fall on the public.

Currently, bond pools exist in several states. The Alaska bond pool makes sure that sufficient funds are available in the pool even if the defaulting mine has not made all its payments. The defaulted mining operator is allowed to rejoin the pool if the operator reimburses the pool for all costs and pays additional participation costs. In Nevada 15% of the financial assurance is being held in the form of bond pools.

Incrementally Funded Trusts

These are administered by a third party and are accounts into which a mine operator makes payments that are dedicated to fully fund its own land reclamation obligation. To set up the fund the operator makes the first payment before mining begins, with subsequent payments being made into the fund as an ongoing process. The risk to the public in such a fund is that the operator might default before the fund becomes fully funded.

Wyoming

Wyoming is the largest producer of coal in the country, almost all of which is being mined from surface mines. The state has adopted a phased bond release program. The program constitutes three separate phases depending on the extent to which the mined land has been reclaimed. Phase 1 requires the mined area being backfilled and drainage controlled. Phase 2 requires the mined area to be revegetated according to the state's standards and so that the reclaimed area does not contribute any suspended particles to the streams. Phase 3 requires that the surface area meet all the standards approved by the reclamation plan.

Types of bonds accepted by the state of Wyoming are:

- Corporate surety bonds, issued by an insurance company holding a Wyoming surety license
- Federal insured Automatically Renewable Certificates of Deposits made payable solely to the Wyoming Department of Environmental Quality. Each CD needs to be purchased from a separate bank and should not exceed $100,000 in face amount

- U.S. Treasury Bonds, Bills, or Notes
- Cash can be deposit with the state Treasurer; in such a case cash does not earn interest
- Letter of Credit
- Self-Bonding
- Combination of any of the above instruments

For an initial bond, the amount to be filed with the administrator prior to commencing any mining is equal to the estimated cost of reclaiming the affected land. The estimated cost is based on the operators' cost estimate submitted with the permit plus the administrator's estimate of the cost to the state of bringing in personnel and equipment in the event the operator fails. Generally, the minimum bond is $10,000, but for surface coal mines in no event is it supposed to be less than $200 per acre of mining land.

After the reclamation for any affected land has been completed, the administrator of the fund can recommend the release of the bond. In such a circumstance up to 75% of the value of the bond can be recommended to be released. The remaining portion of the bond, which cannot be less than $10,000, is held for five years after the completion of reclamation, to assure proper revegetation and restoration of ground water.

Wyoming has an outstanding proposal to the Abandoned Mines Fund to reduce the per tonnage reclamation fees. The new schedule of fees is:

- $.25/ton for surface mined coal
- $.12/ton for underground mined coal
- $.08/ton for lignite mined coal

Kentucky

Kentucky is the third largest coal producing state in the country, behind Wyoming and West Virginia. Kentucky has three coal associations: Kentucky Coal Association, Western Kentucky Coal Association, and Coal Operators and Associates. Kentucky requires the operators prior to undertaking a surface coal mining operation to post reclamation performance bonds. The acceptable sources of bonds are:

- Self Bonds
- Surety Bonds
- Pay fees to alternative bonding systems such as the state's bond pool

The state has adopted a phased bond release program similar to Wyoming's.

Detailed Information about the Kentucky Bond Pool

The Kentucky bond pool consists of all the money collected and the interest earned from the interest bearing account. The money is meant to be used solely under the following circumstances:

- Reclaim in the event of forfeiture
- Compensate the cabinet for the cost of administration

- Fund audits and actuarial studies
- Cover operating and legal expenses

A bond pool commission manages the bond pool. The role of the commission is:

- Assign memberships to the bond pool to different operators
- Assign ratings to the mine operators. Ratings determine how much contribution is needed by the operator towards the pool
- Determine the tonnage fee
- Authorize expenditure from the bond pool

Criteria Required for the Bond Pool Membership

To be eligible to enter the bond pool, an applicant needs to pay a fee of $100 per permit. The commission then determines if the applicant is sufficiently financially stable to enter the bond pool. Based on the financial strength of the operator, the bond pool assigns three separate ratings:

- Rating "A" is assigned to the operator that has demonstrated excellent compliance for the last five of the seven years
- Rating "B" is assigned to the operator that demonstrated acceptable compliance for the last five of the seven years
- Rating "C" is assigned to the operator that demonstrated acceptable compliance for the last three of the five years

Fees Associated With the Bond Pool

Prior to admission to the bond pool each member must pay an admission fee, which depends on the rating achieved by the operator. The fees are as follows:

- $1,000 for Rating "A"
- $2,000 for Rating "B"
- $2,500 for Rating "C"

In addition to the admission fee the operator also needs to pay a permit specific fee. The fee charged is on a per acre basis. They are different for the different rating classes.

- $500 for Rating class "A"
- $1,500 for Rating class "B"
- $2,000 for Rating class "C"

These permit specific bond fees are released upon successful reclamation of the land under the three-phase release program adopted by the state.

If the operator does not qualify for the Kentucky Bond Pool, the operator must demonstrate sufficient financial capability for land reclamation in the form of external bonds or by self-bond. If the operator does not meet these criteria it is not allowed to mine in the state

Pennsylvania

In 1982 Pennsylvania adopted a bonding system to meet federal requirements for land reclamation. Surface coal mining processes in Pennsylvania include surface mining, coal refuse processing, coal preparation plants, and coal disposal. All coal operators in the Commonwealth of Pennsylvania were required by the government to post a bond to cover the cost of land reclamation. The bonding system was composed of two parts: an alternate bonding system that covered the surface mines and the full cost bonding that covered underground mines. The contribution required for each operation was based on the potential reclamation obligations. The full cost bonding system is directed towards refuse disposal and surface activities associated with underground mining. Under this system the operator was required to post a specific flat per acre site-specific bond and contribute towards a pool of funds to be used to supplement forfeited bonds on any site. Under the latter system the operator was required to post a bond to cover the full cost of the land reclamation. Studies conducted on the Pennsylvania bonding system showed that the two stage-bonding systems were not sufficient to cover the land reclamation obligations. Thus in the spring of 1999 Pennsylvania merged the two separate bonding systems into one combined bonding system with the same requirements for surface and underground mines.

Acceptable Bond or Alternatives

The Commonwealth of Pennsylvania will accept financial capability to issue a permit for coal mining in any of the following forms:

- Surety bonds from a reliable insurance company
- Collateral bonds. In this case the department will keep the collateral in its possession until the obligation has been fulfilled
- Self-bonding
- A combination of any of the above mentioned bonding instruments

Period of Liability

For surface coal mining the Department assesses the liability to continue for five years after the reclamation process has been completed. For the underground coal mining the liability continues for five years after the completion of the reclamation except in the following circumstances:

- If there is a risk of water pollution, the Department will assess how long the liability is expected to continue
- For bituminous coal mining, the liability is assumed to continue for 10 additional years after the reclamation is complete.

Bond Rate Calculation

Operators are required to pay a permit fee and an additional bond amount per acre based on the type of operation within the entire permit area.

The minimum requirements for an entire permit area are:

- $10,000 for bituminous coal mining
- $5,000 for anthracite coal mining

The per acre rates are as follows:

TABLE 3.1

Activity	Variables	Bond Amount
Surface Coal	Support areas	$1,000 / acre
	Highwall: 0-85 feet	$3,000 / acre
	Highwall: 86-115 feet	$4,000 / acre
	Highwall: 116-150 feet	$5,000 / acre
	Highwall:>150 feet	Site Specific Evaluation
Coal Preparation Plants	Land Reclamation	$3,000 / acre
	Demolition of Structures	Site Specific Evaluation
Coal refuse reprocessing		$1,000 / acre
Coal Refuse Disposal		$1,000 / acre

In addition to the bond, a one-time non-refundable reclamation fee based on the total acreage of the permit being issued is assessed for the surface coal mining and coal refuse preprocessing operations. This fee is assessed at $100 per acre.

Under the new system of full cost bond requirement, the value of the bond is determined on a site-by-site basis. The actual cost is determined as a sum of direct costs and indirect costs. The direct costs are the sum of the different unit operations at the developed bond rate guidelines. Indirect costs are a percentage of the direct costs. The bond rate guidelines being adopted by Commonwealth of Pennsylvania are shown in Table 3.2.

TABLE 3.2

Bond Rate Guidelines

Unit Operation	Bond Rate	Term
Mobilization/Demobilization	3-5%	Job
Dewatering	$ 1,000	Million gallons
Grading –Select	$ 1,200	Acre
Grading -<500 push	$ 0.50	Cubic Yard
Grading - >500 push	$ 0.08	Cubic Yard
Erosion and Sedimentation Controls	$ 0.05	Job
Ditch Excavation	$ 4	Cubic Yard

TABLE 3.2			
Bond Rate Guidelines			
Lining -R3	$	17	Square Yard
Lining -R4	$	20	Square Yard
Lining -R5	$	30	Square Yard
Jute Matting	$	3	Square Yard
High Velocity Erosion Control	$	3	Square Yard
PVC Lining	$	10	Square Yard
Filter Fabric	$	0.70	Square Yard
Subsurface Drain	$	12	Lineal Foot
Revegetation	$	1,000	Acre
Seed Bed Preparation	$	125	Acre
Agricultural Lime	$	30	Tons
Fertilizer	$	200	Pound
Nitrogen	$	0.55	Pound
Phosphate	$	0.35	Pound
Potassium	$	0.30	Pound
Seed Type 1	$	3.00	Pound
Seed Type 2	$	6.90	Pound
Mulch	$	300	Acre
Trees	$	0.15	Stem

Bond Release

Similar to the states of Wyoming and Kentucky, Pennsylvania also follows a three-phased bond release program.

Virginia

Virginia is among the 24 states that have taken primary responsibility of land reclamation for coal mining. To do this effectively it requires that the mining companies demonstrate sufficient financial capability and post surety bonds or contribute to the Virginia Reclamation Fund

Bond Requirements

Entrance fees are as follows:

- Entrance fee of $1,000 charged for each applicable permit
- In case the total balance of the fund is less than $1,750,000 the director can increase the entrance fee from $1,000 to $5,000
- The fund charges a renewal fee of $1,000 for any permit renewal

Per acreage fee:
In addition to the above entrance fee there is a bond requirement for the fund. The value of the bond

is determined as follows:

- For underground mining operations that got the permits before 1991, the bond is calculated at the rate of $1,000 per acre of land being mined. The minimum value of the bond is $40,000
- For underground mining operations that got the permits after 1991, the bond rate is $3,000 per acre of land mine. The minimum value of the bond required in this case is still $40,000
- For other coal mining operations that entered before July 1991 the bond is calculated at the rate of $1,500 per acre with a minimum value of $100,000
- For coal mining operations that entered after July 1991 and not doing underground mining, the bond is calculated at the rate of $3,000 per acre with a minimum value of $100,000

In addition to the above fees, if the balance of the bond fund drops below $1,750,000, the operators are required to pay additional fees. These fees are determined at the following rates:

- For a surface mining company the additional fee is four cents per ton of mined coal
- For a deep mining company the additional fee is three cents per ton of mined coal

Release of Bond

Similar to the other states Virginia also follows a three-phased bond release program.

Alaska

Alaska has a bond fund. The amount of bond required is $750 per acre of land being mined. If the mine operator can show the commissioner that the per acreage cost of land reclamation is less than $750, the bond requirement can be reduced. As an alternative to posting the bond the mine operators can decide to enter the state wide bond pool. Operators that decide to enter the pool have to submit an initial amount of 15% of the determined bond requirement plus an additional non refundable annual fee that equals 5% of the bond requirement. Upon successful reclamation of the land the initial 15% fee is refunded.

Idaho

Idaho has a bond fund. The amount of the bond is determined as the estimated costs of reclamation under the reclamation plan for each acre of land to be affected during the first year of operation plus an additional 10%. The maximum amount of bond required for each acre of land is set at $2,500.

Acceptable bonds or alternatives under the Idaho bonding program are:

- Corporate surety bond
- Collateral bond
- Letters of Credit

Montana

Montana requires that a bond be posted for every acre of land being mined. The minimum amount of the bond is $200 per acre and the maximum is $2,500. Regardless of these limits the bond is set equal to the estimated costs to reclaim the land by the state. The State of Montana accepts cash, surety bonds or certificate of deposits as an acceptable form of bond.

SECTION 4

DATA

Data provided for this study is enumerated and discussed below. We did not audit or verify the data.

Data Originally Provided By West Virginia

The information listed below was provided by West Virginia's Department of Environmental Protection (DEP). Most of this information was provided during the proposal process or at our October 5, 2004 meeting with Department personnel. With one exception, the remainder was provided in an October 13, 2004 e-mail. The two exceptions were the draft report of "A Fiscal Risk Model of the Special Reclamation Fund and Mine Operations in West Virginia" by Michael J. Hicks, PhD, which was provided December 3, 2004, and the data on permit forfeitures by date of issuance, which was provided on February 10, 2005.

The following statutory information was provided:

- Senate Bill No. 5003, passed September 15, 2001.
- Section 22-3-11. Bonds; amount and method of bounding; bonding requirements; special reclamation tax and fund; prohibited acts; period of bond liability.
- Section 22-3-12. Site-specific bonding; legislative rule; contents of legislative rule; legislative intent.
- Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 (SMRCA), passed August 3, 1997, and all revisions through December 31, 1993.
- Section 22-1-17. Special reclamation fund advisory council.

The following studies completed by other parties were provided:

- "Consensus Coal Production Forecast for West Virginia" by George W. Hammond, PhD issued in May 2004. This study provides actual coal production for 1998 through 2003 and a consensus forecast for 2004 through 2025.
- "Evaluation of Acid Mine Drainage Treatment Strategies Under the Special Reclamation Fund" by Paul Ziemkiewicz, PhD issued May 31, 2004. The conclusion of interest for our analysis was that 20-year treatment costs ranged from $459,000 to $2,858,000 with the large differences due to site-specific factors.

- "A Fiscal Risk Model of the Special Reclamation Fund and Mine Operations in West Virginia" by Michael J. Hicks, PhD issued in draft December 2004. This study concluded that factors at the firm level are not correlated with AML violations, bond forfeiture, civil penalties, or state cessation orders. It also noted that the number of firms in this category was a very small (unstated) percentage of the permitted firms.

The following investment information for the Special Reclamation Fund was provided:

- Note 4 – Cash and Investments to the June 30, 2003 audited financial statement of the Special Reclamation Fund
- Investment performance report for December 2001, December 2002, and December 2003
- Statement of accounts at December 31, 2001, December 31, 2002, and December 31, 2003.
- Historical investment returns of the separate pools managed by the West Virginia Investment Management Board. This information was provided in an Excel file.

The following accounting information for the Special Reclamation Fund was provided:

- Balance Sheet at June 30, 1992 and corresponding Independent Accountants' Compilation Report by Deloitte & Touche;
- A March 9, 1993 review by independent accountant Deloitte & Touche of the Department's procedures with respect to the accounting books and records;
- The Department's October 5, 2004 responses to the comments in the March 9, 1993 review tied to page number.
- Combined Balance Sheet and Statement of Revenues, Expenditures, and Changes in Fund Balances for fiscal years ending June 30, 2001, 2002, and 2003.
- Statements of Cash Flows at July 31, 2004 (sic) for the fiscal year ending June 30, 2004 including monthly statements of revenue by source for July 2003 through June 2004.
- Statement of Cash Flows at August 31, 2004 for the fiscal year ending June 30, 2005 including monthly statements of revenue by source for July and August 2004.

Additional information provided is as follows:

- "Actuarial Study for West Virginia Special Reclamation Fund" issued in March 1993 by Deloitte & Touche.

- Model facts and assumptions used by the Department to project its cash flow for the next few years. This is the model suggested by the US Office of Surface Mining, which was adopted by the Special Reclamation Fund Advisory Council.

- Cash Flow Projection of Special Reclamation Funds from SR Reports 7/31/04 and Future Liabilities through December 31, 2010 summarized by fiscal year ending June 30.

- Cash Flow Projection of Special Reclamation Funds from SR Reports 8/31/04 and Future Liabilities through December 31, 2010 summarized by fiscal quarter – two different coal tax assumptions.

- Water Quality Liability Report for fiscal year 2002 prepared December 11, 2002. Shows office, company, permit number, county, estimated water quality total capital, estimated water quality annual chemical costs, estimated administrative costs, 20% contingency costs, and total operating costs.

- Water Quality Liability Report for fiscal year 2003 prepared January 6, 2004. This shows office, company, permit number, county, estimated water quality total capital, estimated water quality annual chemical costs, estimated administrative costs, 20% contingency costs, and total operating costs.

- Report on Reclamation Completed 1/1/01-12/31/03. Shows reclamation completion date, company, permit number, permit acres, land status, date of revocation, reclamation start date, and office.

- Report on OSR Reclamation Costs 1/1/01-12/31/03. Shows permit number, land status, water status, reclamation start date, date water quality construction started, bond collected, land dollars, land capital FIMS cost, FIMS administrative cost, actual water quality capital dollars, actual operating and maintenance dollars, water quality FIMS cost, water quality maintenance FIMS cost, and total cost. This was provided in hard copy and in an Excel spreadsheet.

- Land Reclamation Report for fiscal year 2002 prepared December 9, 2002. Shows office, company, permit number, county, permit acres, disturbed acres, estimated liability, date of revocation, and liability report post date.

- Land Reclamation Report for fiscal year 2003 prepared January 6, 2004. Shows office, company, permit number, county, permit acres, disturbed acres, estimated liability, date of revocation, and liability report post date.

- TPL and SSR Current Liability Report for fiscal year 2003 prepared January 6, 2004. Shows office, company, permit number, county, permit acres, disturbed acres, current liability, date of revocation, and liability report post date.

- OSR Bond Collected Permit Acres for 1/1/93-12/31/03 showing permit number, date of revocation, permit acres, disturbed acres, bond collected, average bond per permit, and bond rate per permit acre. This was provided in an Excel spreadsheet.

- Closed Progress Report as of 9/24/04. This shows company name, permit number, acres, county, bond amount, bond type, 30-day date, hearing date, consent date, final date, collection date, and comments. This was provided in an Excel spreadsheet.

- Active Progress Report as of 10/5/04. This shows company name, permit number, acres, county, bond amount, bond type, 30-day date, hearing date, consent date, final date, collection date, and comments. This was provided in an Excel spreadsheet.

- An untitled, undated report showing company name, permit number, acres, bond amount, bond type, date of revocation, collection date, amount collected, balance uncollected, comments, and surety company. This was provided in an Excel spreadsheet.

- Historical data on the number of permits issued by year from 1977 to 2004, the number of permits released, and the number forfeited, by year of forfeiture and by year of issuance.

Data Provided for the Model Revision

DEP provided updated and more detailed information for the model revision as detailed below. Some of this information was updated during the model revision, requiring further analysis.

The following statutory information was provided:

- House Bill No. 3033, approved by the Governor on April 18, 2005, which:
  - extends the temporary 7 cent tax for 18 months to September 30, 2006.
  - requires the Secretary of the DEP to
    - pursue cost effective alternative water treatment strategies.
    - conduct formal actuarial studies every two years and conduct informal reviews annually on the Special Reclamation Fund.
    - determine the feasibility of allowing full cost bonding in lieu of the per ton coal tax.
    - determine the feasibility of creating a water quality trust fund to provide long-term funding for water treatment from forfeited sites and to reduce the portion of the per ton coal tax.
    - determine the feasibility of establishing a bonding requirement for water treatment activities in lieu of a portion of the per ton coal tax.

The following files were provided in pdf form on 6/24/05 and in Excel spreadsheets 6/30/05:

- Summary of water quality capital costs and water quality on-going annual operating costs (WATER OPERATIONS file). We were provided with an updated Excel file on 8/11/05.

- Historical summary of Land capital expenditures and Water capital expenditures for all revoked coal mine permits as of May 31, 2005 (LAND & WATER CAPITAL file).

- Cash flow forecast of Special Reclamation Funds (CASHFLOW file).

- Coal Production History and Forecast (COAL file). We were provided with an updated Excel file on 8/5/05.

- Permits Issued by year from 1994 (ISSUED PERMITS file). We were provided with an updated Excel file on 8/5/05.

- Permitted Acres by Year from 1994 (ACRES file). We were provided with an updated Excel file on 8/5/05.

We were provided with the following additional information on 6/30/05:

- History of WVDEP mining and reclamation program amendments.

- Schedule of Open Permits with Acreage and Bond amounts (OPEN PERMIT file).

- Schedule of Released Permits with Original Acres/Bond and Current Acres/Bond (RELEASED PERMIT file).

We also were provided with the following information:

- Permit status definitions on 7/11/05.

- Answers to questions asked on 7/28/05 and 8/4/05 about data and analysis results to date on 8/11/05.

- Five years of revenue totals for bond forfeitures, civil penalties, and court settlements on 8/23/05.

- Additional revenue information for the 2002, 2003, and 2004 fiscal years on 8/23/05.

- Information on which sites were expected to have ongoing water costs on 9/9/05.

- Split of the legacy encumbered costs on 9/20/2005.

We understand there is a study being performed by Marshall University regarding funding and reclamation options for the SFR that will not be completed until the end of October. The results from that study were not, therefore, included in this study.

SECTION 5

ACTUARIAL ASSUMPTIONS

This section summarizes the actuarial assumptions used in the measurement

1.	Discount Rate	2.50 percent
2.	General cost inflation	3.00 percent
3.	Wage inflation	3.00 percent
4.	Rate of forfeiture of permits	Rates vary by year of issuance and years since issuance, and amount of bond. See tables 5.1 and 5.2
5.	Rate of release of permits	Rates vary by year of issuance and years since issuance. See table 5.1
6	Land reclamation cost per acre in 2005 dollars	$5,613
7.	Water reclamation cost per acre in 2005 dollars	$485, or 9 percent of land reclamation cost per
8.	Water treatment costs as a percent of water capital expenditures	30 percent
9.	Time period between permit forfeiture and land and water capital expenditure	4 years
10.	Time period between water capital expenditure completion and ongoing water treatment costs	None. Ongoing water treatment costs are assumed to commence in the year that water treatment expenditures occur
11.	Investment income	Based on expected full year return on prior year fund balance. Annual cash flows of revenues and expenditures assumed to operate in a non-interest bearing account.

Some expenses that DEP originally categorized as water capital costs were designated as land capital costs for the purpose of this study because DEP expects no ongoing water treatment at these sites.

Table 5.1 shows the rates by year of issuance and years since issuance

Table 5.1 -- Valuation Rates of Forfeiture and Release of Permit				
Years Since Issuance	Permits Issued Before 1992 Forfeiture	Release	Permits Issued After 1991 Forfeiture	Release
1			0.05%	0.15%
2			0.65%	0.60%
3			1.30%	1.30%
4			1.10%	1.75%
5			1.00%	2.00%
6			1.00%	2.75%
7			0.75%	3.50%
8			0.75%	3.00%
9			0.75%	3.00%
10			0.75%	3.00%
11			0.75%	3.00%
12			0.75%	3.00%
13	2.00%	6.00%	0.75%	3.00%
14	2.00%	6.00%	0.75%	3.00%
15	2.00%	6.00%	0.75%	3.00%
16	2.00%	6.00%	0.75%	3.00%
17	1.50%	6.00%	0.75%	3.00%
18	1.50%	6.00%	0.75%	3.00%
19	1.50%	6.00%	0.75%	3.00%
20	1.50%	6.00%	0.75%	3.00%
Over 20	1.50%	6.00%	0.75%	3.00%

We applied these rates to the 1,912 in-force permits and compared the expected bond forfeiture receipts with the actual receipts over the past few years. Applying the forfeiture rates to permits of all bond sizes produced an expected level of receipts significantly higher than the recent experience. We then introduced weights to the forfeiture rates depending on the size of the bond.

Table 5.2 – Weighting Factors by Size of Bond	
Bond Size	Weighting
$10,000 and smaller	250%
Over $10,000 and under $100,000	100%
$100, 000 and larger	38%

Table 5.3 shows the following annual tonnage of coal production was assumed in the forecast. The tonnage from active acreage was determined as the consensus forecast tonnage in each year multiplied the ratio of active acreage in the beginning of each year to the active acreage at the beginning of fiscal year 2006.[3]

Table 5.3 – Coal Production			
Calendar	Production Tons From Consensus Forecast	Acreage of Inforce permits	Production Tons from In-force Acreage
2005	140,600,000	226,352	140,350,000
2006	140,100,000	214,255	132,044,672
2007	138,900,000	202,361	124,312,147
2008	139,200,000	190,777	117,364,574
2009	139,300,000	179,574	109,163,577
2010	135,900,000	168,855	100,745,218
2011	134,200,000	158,621	93,588,087
2012	132,900,000	148,869	86,486,056
2013	130,100,000	139,662	80,890,421
2014	132,100,000	131,042	76,303,094
2015	131,500,000	122,985	70,932,511
2016	129,600,000	115,453	66,919,928
2017	132,800,000	108,412	64,131,949
2018	135,000,000	101,831	61,723,527
2019	139,400,000	95,679	59,664,256
2020	142,900,000	89,928	57,309,629
2021	145,600,000	84,552	54,668,049
2022	147,100,000	79,525	51,874,536
2023	148,200,000	74,826	49,073,831
2024	148,700,000	70,433	46,348,328
2025	149,200,000	66,326	43,718,994

[3] Example: Tonnage from active acreage in 2011 = 135,050,000 x (168,855 226,352) = 100,745,218