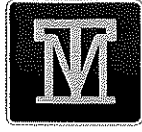


Taylor & Mulder
Property and Casualty Consulting Actuaries

Taylor & Mulder, Inc.

**Virginia Coal Surface Mining Reclamation Fund
Actuarial Study as of February 29, 2024**

April 2024



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April 25, 2024

Mr. Gregory Baker
Technical / Reclamation Services Manager
Virginia Department of Energy
3405 Mountain Empire Rd.
Big Stone Gap, VA 24219

Dear Mr. Baker,

Enclosed is the actuarial review of the Virginia Coal Surface Mining Reclamation Fund (“the Fund”) as of February 29, 2024.

The first section in the text of our report is the *Executive Summary*. This section presents our conclusions and recommendations. It also describes the purpose and scope of our report, explains the distribution and use of our report, and provides the conditions and limitations underlying our work. This section of our report also includes the Background section which provides information about the Fund history.

The next section of the text of our report is the *Actuarial Analysis* that describes the sources of data, our overall methodology, the selection of factors and specific methodologies and considerations by line of business. It also describes the selection of ultimate losses. The *Exhibits* section of our report follows the text of the report and includes all of our analyses.

Please feel free to call if you have any questions regarding any aspect of our report.

Sincerely,

Daniel W. Lupton, FCAS, MAAA, CSPA, MBA

Evelyn Toni Mulder, FCAS, MAAA, FCA

Bobby J. Jaegers, FCAS, MAAA, CSPA, FCA

Enclosures

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Executive Summary

Purpose & Scope

Taylor & Mulder, Inc (“T&M”) was requested by Virginia Energy to perform an actuarial study of Virginia’s Coal Surface Mining Reclamation Fund. This report contains a summary of our conclusions, along with a description of the analysis underlying our conclusions.

Specifically, T&M was asked to conduct an actuarial analysis to include within its scope the following tasks:

1. Make a professional determination and written recommendation, including a statement of actuarial opinion, as to the fiscal soundness of the Virginia Coal Surface Mining Reclamation Fund. The written recommendation will be detailed in a report that outlines the financial status and adequacy of the Virginia Coal Surface Mine Reclamation Fund.
2. The professional determination and written recommendation, including the statement of actuarial opinion, should include the following:
 - a. An evaluation to determine the Virginia Coal Surface Mine Reclamation Fund’s fiscal soundness in accordance with applicable Actuarial Standards of Practice as promulgated by the Actuarial Standards Board (ASB).
 - b. Present a comparison of present assets, prospective revenues, and estimated liabilities along with a risk assessment of uncertainties for both revenues and liabilities of the Virginia Coal Surface Mine Reclamation Fund for a minimum of 10 years, or other mutually agreed upon timeframes.
 - c. An evaluation of the accuracy of the following elements of the Virginia Coal Surface Mine Reclamation Fund:
 - i. Revenue streams required for solvency and continued support of liabilities.
 - ii. Liability amount estimates.
 - iii. Administrative and general expenses; and all other cashflow projection components.
 - d. An evaluation of the present and future prospective fiscal soundness of the Virginia Coal Surface Mine Reclamation Fund.

- e. An evaluation of the prospective fiscal soundness under alternative bonding methods.
 - f. An analysis and discussion of the ability of the Virginia Coal Surface Mine Reclamation Fund to support long-term liabilities, (exceeding 10 years).
3. A detailed review of prospective loss exposure, historic loss patterns, frequency and severity of loss activity, and estimates of ultimate incurred losses under expected and adverse scenarios for the existing Reclamation Guaranty Fund.
 4. A detailed review of existing funding levels for the current Reclamation Guaranty Fund based on expected, known liabilities and production trends in the coal industry.
 5. Complete an evaluation of the current Per Acre Bonding Rate applied to Pool Bonded Permits and determine if these rates should be adjusted to better strengthen the fiscal soundness of the Virginia Coal Surface Mine Reclamation Fund.
 6. Complete an evaluation of the current Tonnage Tax Rate applied to Pool Bonded Permits and determine if these rates should be adjusted to better strengthen the fiscal soundness of the Reclamation Fund for each mine type.
 7. Discuss Funding Options available to capitalize the pool over various time frames based on production fees that may vary with operator compliance, coal production, and type of mining operation, and other scenarios outlined by VACSMRR.
 8. Complete a review and analysis of other coal producing state's coal mining reclamation and bonding structures with a summary of findings provided in a written report to the Virginia Coal Surface Mining Reclamation Fund Advisory Board.
 9. Provide a written preliminary workplan and a final workplan meeting the scheduling requirements of the project that includes a communication strategy with the Virginia Coal Surface Mining Reclamation Advisory Board. The workplan shall detail the project schedule with timetables for key meetings and deliverables.
 10. Provide recommendations to the Virginia Coal Surface Mining Reclamation Advisory Board of alternative methods of updating bonding calculations, obtaining monies, and use of monies in the Virginia Coal Surface Mine Reclamation Fund, and issues related to reclamation of fund permitted and bonded land for which the performance security was forfeited.

11. Provide recommendations as to whether different types of operations should be subject to varying bond rates.
12. Provide recommendation as to whether permits with extended times and distances for mining and reclamation should be subject to varying bond rates.
13. Analyze a sample of sufficient size necessary to assess risk from pool bond participants based upon 60% of the sample consisting of surface mines, 20% being underground mines, and additional as approved by the Virginia Coal Surface Mining Reclamation Advisory Board.
14. Perform a risk assessment of a large corporation with numerous permits based upon current reclamation liabilities.
15. The Offeror's proposal response should list specific information as may be needed from the Virginia Department of Energy on behalf of the Virginia Coal Surface Mining Reclamation Advisory Board in performance of the project.
16. Identify and additional data needs for performance of the project.\
17. Detail specific plans for providing the proposed services including, but not limited to:
 - a. Models to be used and a justification for the choice.
 - b. Data acquisition requirements.
 - c. Participation in and travel to public and/or Agency meetings.
 - d. Preparation of reports and presentation materials.
 - e. General format of reports to be submitted.
18. Provide an on-site exit conference with the Virginia Coal Surface Mining Reclamation Advisory Board at conclusion of the project.

This report presents the results of those analyses. This report was prepared by:

- Daniel W. Lupton, FCAS, MAAA, CSPA, MBA, Vice President and Consulting Actuary,
- Evelyn Toni Mulder, FCAS, MAAA, FCA, Principal and Consulting Actuary,
- Bobby J. Jaegers, ACAS, MAAA, CSPA, FCA, Consulting Actuary

In accordance with the requirements of the Actuarial Standards of Practice in making statements of actuarial opinion, I provide the following statement:

I, Daniel W. Lupton, am Vice President and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.

Conclusions

Overall Fund Liabilities

The following chart shows the projected liabilities net of bond forfeiture revenue for reclamation costs and administrative expenses associated with the current open permits:

Virginia Coal Surface Mining Reclamation Fund		
Summary of Fund Gross Liabilities		
Expense Category	Undiscounted Liability	Discounted Liability
Reclamation Costs	10,047,784	8,404,594
Administrative Expense	96,380	87,585
Total	10,144,164	8,492,180

Based on the actuarial central estimate, the fund is solvent as its current assets exceed its anticipated net liability.

While these projections make appropriate actuarial provision on average for the present and prospective liabilities associated with the current cohort of in-force permits, significant variation around these estimates is possible. This is due to several uncertainties:

1. The potential for future forfeiture rates to deviate from the actuarial central estimate,
2. The potential for multiple permits to be forfeited simultaneously due to individual companies holding multiple permits,
3. The uncertainty associated with the relative risk posed by different kinds of permits and different permit statuses,
4. The potential emergence of large individual liabilities that could lead to significant variation in costs, and
5. The effect of variations in inflationary forces on reclamation expenses and the effect of variations in investment yields on the present value of liabilities.

With respect to potential variation in future forfeiture rates, it should be noted that since 2014, only 1 permit forfeiture has led to reclamation costs for the Fund. Prior to 2014, the frequency of forfeiture was also very low. Given the small pool of permits, it is challenging to estimate a long-run average forfeiture rate based on Virginia data alone. Consequently, rates of forfeiture in other states were considered as part of the projection process.

To account for the uncertainty in long-run forfeiture rates, we have considered reclamation expenses based on a range of possible forfeiture rate scenarios. The low and high estimated scenarios are respectively half and double the assumed central estimate of forfeiture rates.

Virginia Coal Surface Mining Reclamation Fund			
Range of Discounted Net Liabilities			
Expense Category	Low Estimate	Central Estimate	High Estimate
Reclamation Costs	8,209,972	8,404,594	9,513,082
Administrative Expense	129,745	87,585	59,034
Total	8,339,717	8,492,180	9,572,116

If experience in Virginia continues favorably, the central estimate could be a conservative estimate of future liabilities. However, as a result of the potentially challenging economic environment for coal and the historical forfeiture rate, there is a greater degree of uncertainty in the future forfeiture rate.

The small changes to the administrative expenses in these scenarios are a reflection of changes to the anticipated timing and duration of payments.

We note that the total mean reclamation expense projection between the low and high estimated scenario are not significantly different. This suggests that the result is not highly sensitive to changes in forfeiture rate assumptions – in part because of the relatively small pool of permits.

Fund Assets

In addition to projecting the Fund’s liabilities, we have also projected the Fund’s assets. This was performed in the context of modeling future fiscal year cash flows. The following table shows the

anticipated income from the current cohort of permits over the subsequent 10- and 25-year time horizons:

Virginia Coal Surface Mining Reclamation Fund					
Anticipated Fund Revenues					
Timeframe	Coal Tax Income	Bond Revenue	Civil Penalties	Interest Income	Total Income
10 Years	2,947,724	1,340,608	889	3,234,428	7,523,650
25 Years	6,632,874	1,352,735	900	6,945,763	14,932,272

Coal tax revenue is based on projecting historical mined coal amounts to the future based on USEIA projections for the Appalachian region. Bond revenues are simulated simultaneously with forfeitures. Civil penalties are projected to follow reclamation activity levels but are de minimis.

Interest income is projected based in part on duration-matched US Treasury yields for 2024. This means projecting the average future date of payment for reclamation expenses and discounting expenses at an expected return equal to a bond of equivalent duration. However, because US Treasury yields are at a recent high and are expected to decrease in the future, the anticipated investment yield for 2025 and subsequent reduce down to 2.00% over five years and equal 2.00% for years 2029 and subsequent.

Uncertainty exists in the anticipated interest income, which depends on several factors, including coal tax revenues, anticipated reclamation expenses, investment yields over time, and the revenues and expenses associated with future permits that are not currently in force. For example, higher-than-expected reclamation expenses could deplete fund balances and result in lower-than-expected interest income. The following chart shows the anticipated investment income based on the low, central, and high, and shock loss forfeiture estimates:

**Virginia Coal Surface Mining Reclamation Fund
Range of Interest Income Results by Forfeiture Rate**

Timeframe	Low Estimate Forfeiture	Central Estimate	High Estimate Forfeiture	Shock Loss
10 Years	3,405,741	3,234,428	2,956,149	4,787,060
20 Years	7,301,031	6,945,763	6,167,318	4,861,235

In the shock loss scenario, funds are depleted by 2034, significantly curtailing anticipated interest income.

Financial Projections

Our projections of revenues and expenses for the Fund imply that the Fund will be solvent for at least the next 10 years. The following chart shows the anticipated income, expense, and ending balance for each of the next 10 years:

**Virginia Coal Surface Mining Reclamation Fund
Financial Projection for Next 10 Years**

Year	Income	Reclamation Expense*	Admin Expense	Beginning Balance	Ending Balance
2024	1,366,945	0	34,076	11,835,451	13,168,320
2025	1,122,116	0	22,333	13,168,320	14,268,103
2026	991,629	0	14,558	14,268,103	15,245,174
2027	868,812	3,563,706	9,635	15,245,174	12,540,644
2028	709,329	2,324,240	5,464	12,540,644	10,920,269
2029	559,522	1,515,097	3,526	10,920,269	9,961,168
2030	504,277	1,002,767	2,460	9,961,168	9,460,218
2031	479,022	568,645	1,614	9,460,218	9,368,981
2032	467,741	366,950	1,050	9,368,981	9,468,722
2033	454,258	256,039	727	9,468,722	9,666,214

*Note that projected reclamation expenses are delayed to reflect the anticipated time between forfeiture and reclamation activity.

Shock Losses and Alternative Funding Structures

Under the mean outcomes from the low, central, and high estimated forfeiture rate scenarios, the fund is anticipated to remain solvent through at least 2048. However, there are nine companies

whose bankruptcies could generate reclamation expenses net of anticipated bond recoveries that exceed the current fund balance as of December 31, 2023. Those companies are:

Virginia Coal Surface Mining Reclamation Fund			
Large Permit Holders			
Company Name	Total Liability	Total Bond	Net Liability
A & G Coal Corporation	190,437,490	29,742,825	160,694,665
Red River Coal Company, Inc. ~90%	88,000,418	5,662,600	82,339,190
Paramont Contura, LLC	99,134,980	18,014,100	81,120,880
Virginia Fuel Corporation	83,653,220	10,953,975	72,699,245
The Black Diamond Company	84,985,910	15,055,000	70,520,518
Clintwood JOD, LLC	59,108,408	11,116,600	47,997,908
Russell County Reclamation, LLC	29,150,100	2,686,800	26,463,300
Norton Coal Company, LLC <i>united</i>	27,446,580	2,906,300	24,540,280
Buchanan Minerals, LLC <i>united</i>	25,207,325	2,505,000	22,702,325
Average	76,347,159	10,960,356	65,458,701

In the average shock loss scenario, the fund would not be solvent through 2048 under the current bonding and coal tax structure.

Many such scenarios are possible, and each is highly dependent upon assumptions such as annual coal production in the state, the number of shock losses, the maximum pace of reclamation (and therefore the maximum reclamation expense per year), and the timing of payments and incomes. It is impossible to consider every possible scenario. However, in the case of the average net shock loss of \$65,458,701 and assuming a maximum land reclamation expense of \$3.5 million per year, a 1,020% increase in coal taxes from all sources would be necessary to ensure the fund remains solvent through 2048.

We note that based on the assumed maximum annual payout of \$3.5 million per year, a \$65.5 million shock loss would take roughly 23 years to reclaim. Under the current tax structure and bonding structure, a \$65.5 million loss experienced in 2024 would lead the fund to become insolvent on a cash basis during the 2034 fiscal year due to the assumed maximum payout of \$3.5 million. It would therefore be clear long before insolvency that the fund would be technically insolvent, having liabilities exceeding the fund's available assets.

Background

The Coal Surface Mine Reclamation Fund was established in 1982 as an alternative bonding method for coal mines to ensure reclamation of mined lands. This program is funded through bond revenues, civil penalties, investment income, and coal taxes. The fund is overseen by the Coal Surface Mining Reclamation Fund Advisory Board.

Report Distribution & Use

This report has been prepared for internal use by the management of the Virginia Coal Surface Mining Reclamation Fund and its board, its accountants, auditors, and attorneys, and the Virginia legislature. The Fund is not authorized to include this report in any marketing or request for proposal solicitations. In addition, it should be understood that T&M consultants are available to respond to any questions by authorized third parties with respect to this report.

Conditions & Limitations

The analyses contained in this report were performed using accepted loss and loss adjustment expense reserving methods adjusted to the special needs of the Fund and in conformance with sound actuarial standards and principles. T&M introduced assumptions and judgments that we considered appropriate in the circumstances.

With regard to projections of ultimate values, it should be understood that the emergence and settlement of claims are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future ultimate losses and loss expenses are inherently uncertain because of the random nature of claims occurrences. They are also dependent upon future contingent events and are affected by many additional factors.

The Fund's claim reserving procedures, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the Fund, improvements in technology, and many other economic, legal, political, legislative and social factors all can have significant effects on ultimate claim costs. Therefore, we cannot warrant that actual developments

will not differ from current projections. Such differences could be upward or downward and could be significant.

In summary, the ultimate loss and loss adjustment expense levels estimated in this report are subject to potential variations in estimation due to:

1. the fact that the ultimate liability of the Fund is subject to the outcome of events yet to occur;
2. the unanticipated changes in the legal, economic, legislative or claims adjudication environments;
3. statistical fluctuation in losses around the estimated or expected values when all other factors remain constant; and
4. the fact that the actual future loss and loss payment and reporting patterns may differ from those applied in the determination of the expected losses or there may be unanticipated changes in the loss and expense loss and expense payment and reporting patterns.

Accordingly, no assurance can be given that future loss emergence will not deviate from the estimated ultimate loss and loss adjustment expenses. However, the ultimate loss and loss adjustment expense estimates were based on a reasonable application of generally accepted actuarial procedures and techniques applied to the information available.

We reviewed the information for overall reasonableness and consistency.

T&M relied without audit or verification on historical loss, loss adjustment expense, exposure data, and other information provided by the Fund and its employees. T&M has relied upon the data provided and on the oral and/or written statements made regarding the quality, accuracy, and completeness of the data and information supplied. Any inaccuracies or inconsistencies in the data could have a significant effect on the conclusions drawn.

Should any inaccuracies be found in the data, T&M should be notified immediately so that the analysis can be adjusted accordingly.

With regard to projections of estimated revenues, it should be understood that the revenue streams are subject to uncertainty similar to that experienced in modeling loss projections. While we have used our best professional judgment in all instances, projections of future revenues are inherently uncertain due to potential changes in technology, the implementation of environmental requirements, the introduction of and/or enhanced use of alternative fuels, and changes in the economy among others. While T&M has used its best judgment in selecting values and trends for each category of revenue, actual revenue collected is dependent upon unknown future events and may be affected by additional factors outside of the Fund's control.

This report is limited in scope to the estimate of the level of reserve adequacy at the evaluation date of the report. It also includes projections regarding cash flow of the operations of the Fund under certain narrow assumptions and conditions.

This report was prepared for use by persons technically competent in insurance financial matters. Persons receiving this report should be made aware of the availability of T&M personnel to answer questions and/or amplify on any matter addressed therein.

Actuarial Analysis

This section of the report provides additional technical details regarding the assumptions and methodologies employed in forming the opinions discussed above.

Sources of Data

The data underlying our analysis was compiled from several sources. Unless otherwise stated, data was provided by Josh Bolling, Virginia Department of Energy. The following are the primary sources from which data was taken and how each source was used:

- “2023-03-11 (DMLR.PEPR.40) Pool Bond Permits - Permitted - Mine Type.pdf” – This pool bond report contains permits by company, along with status, status date, bond amount, permitted acres, and permit type.
- “2024-03-11 (DMLR.ACPR.05) Pool Bond Permits (135).pdf” – This pool bond report provided the permitted, disturbed, reclaimed, bonded, and regraded acres by permit number.
- “2024-03-11 (DMLR.PEPR.16) Permit Location Report (Cost & Pool Bond).pdf” – This pool bond report contains the permit status and operation status of each permit.
- USEIA Annual Energy Outlook 2023 Report, Table 15 – This table from USEIA includes projected coal production in the Appalachia region for 2022 through 2050 and was used as part of projecting future coal production.
- West Virginia Industry Data – Detailed historical forfeiture rates, bond release rates, and water treatment data from West Virginia was adjusted for anticipated systematic differences in Virginia and used to supplement thin data in Virginia as part of preparing projections for future liabilities and revenues.
- Ohio Industry Data – Information about average costs and forfeiture rates in Ohio was used to supplement Virginia data.

Overall Methodology

Loss Projections

Losses were projected using a stochastic simulation methodology. This means that statistical simulations were performed to consider hypothetical permit forfeitures and releases in future years, following which we reviewed the average of the possible results.

Forfeiture rates by age and type of permit (Surface, Underground, Other) were derived based on forfeiture rates in other states, then adjusted to reflect the overall forfeiture rate in Virginia. Forfeiture rate modification factors were then applied at the individual permit level. The following table shows forfeiture rate modification factors by release stage:

Forfeiture Rate Adjustment Factors by Release Stage	
Status	Factor
Active / Pending Phase 1 Release	1.000
Pending Phase 2 Release	0.667
Pending Phase 3 Release	0.333

This means that permits / mine areas that are already in the process of reclamation have a lower likelihood of forfeiture than permits that have not yet been reclaimed at all. For each permit, an overall average risk factor was determined based on the number of permitted acres that were in each phase.

In addition, forfeiture rate was adjusted based on operation status code according to the following table:

Forfeiture Rate Adjustment Factors by Operation Status Code	
Status	Factor
ACT/NOT PRDCNG	1.250
RECLAIMED/ACT.	1.000
ACTIVE	1.000
INACTIVE	1.500
TEMP CESSATION	1.250
PCESS-NOT PROD	1.250
NOT STARTED	1.000
NOT INSPECTABLE	1.250

This table indicates that inactive or non-producing permits are understood to be riskier overall than active and producing permits.

Finally, a risk factor was included for the possibility of bankruptcy by the company controlling each permit to reflect increased consolidation within the industry. In each simulated hypothetical future year, each company was given a 0.5% risk of bankruptcy. If a company was simulated as having a bankruptcy, each permit controlled by that company was given an extra 30% chance of forfeiture. This is intended to reflect the fact that in many cases, permits held by bankrupt companies are able to be transferred to other businesses, thereby avoiding a liability in the Fund.

The total forfeiture probability in each year was therefore given by the following general formula:

$$\text{Forfeiture Rate} = [\text{Selected Base Forfeiture Rate By Type and Age of Permit}] \times [\text{Release Stage Adjustment Factor}] \times [\text{Operation Status Adjustment Factor}] + [\text{Company Risk}]$$

In the “low forfeiture” and “high forfeiture” scenarios, the base forfeiture rate was further multiplied by 50% or 200%, respectively.

Release probabilities were modeled in a similar manner, selected based on industry release probabilities for each permit type and age of permit. Release probabilities were not modified by the other adjustment factors mentioned above.

In each simulated hypothetical future year, each permit’s changes were simulated. Permit / bond releases were simulated as occurring incrementally, whereas forfeiture was simulated as occurring all at once. For example, suppose a permit has 100 acres. Suppose that in one simulation, in year 1 and 2, 5% is released, and in year 3, the permit is forfeited. Then in year 1, 95 acres remain. At the end of year 2, 90.25 acres would remain. In year 3, the remaining 90.25 acres would be forfeited and would need reclamation. The other 9.75 acres that were released in year 1 and 2 would not require reclamation and would not generate a liability.

Bond amounts were released along with acreage. Liabilities were estimated by multiplying selected costs per acre by the number of permitted / not-yet-reclaimed acres for each permit. Expected costs per acre vary by permit type.

For each of the low, central, and high forfeiture scenarios, 5,000 simulations were conducted for each of 25 future years, for 375,000 simulated years in total.

Following simulation, the results were reviewed. Average losses across all simulations were used as the estimate of anticipated liabilities. All reclamation expenses were delayed by 3 years to reflect the anticipated time between forfeiture and reclamation activity. Expenses are then adjusted for anticipated inflation and discounted based on anticipated investment yield rates.

Revenue Projections

Anticipated coal tax revenues are modeled by considering the anticipated change in Appalachian coal production per year from USEIA projections. Coal production was projected based on the historical coal production amounts for underground, surface, and other associated facilities in recent years in comparison to Appalachian region coal production, then extrapolated to the future based on USEIA estimates.

Administrative Expense Projections

Administrative expenses were projected based on historical administrative expenses from 2015 to 2023. Administrative expenses were reduced in future years to account for the “runoff” of extant permits. It should be noted that our projections do not anticipate reductions in administrative expenses in future years, only that the administrative expenses that are associated with the current cohort of permits will decline in future years as current permits are replaced by newer permits.

Shock Losses

For the purposes of this study, we identified shock losses as the potential loss from permit holders whose net liabilities exceed the assets of the fund. There are three such permit holders, with average

net liability of \$65.5 million. We tested the financial impact to the fund of the average shock loss as a way of understanding the potential impact of shock loss.

For the purposes of testing this shock loss, we assumed that the fund would disburse a maximum of \$3.5 million per fiscal year for reclamation activities.

Exhibits

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Pro Forma Projections
 Actuarial Central Estimate

(1) Calendar Year	Revenues					Expenses				(10) Beginning Balance	E B	
	(2) Coal Tax	(3) Bond Revenue	(4) Civil Penalties	(5) Interest Income	(6) Total Revenue	(7) Reclamation Expense	(8) Admin Expense	(9) Total Expense				
2023												1
2024	359,607	499,705	300	507,333	1,366,945	-	34,076	34,076	34,076	11,835,451	1	
2025	334,592	308,588	208	478,728	1,122,116	-	22,333	22,333	22,333	13,168,320	1	
2026	324,713	204,209	138	462,569	991,629	-	14,558	14,558	14,558	14,268,103	1	
2027	308,467	130,152	93	430,100	868,812	3,563,706	9,635	3,573,342	3,573,342	15,245,174	1	
2028	294,212	73,671	54	341,392	709,329	2,324,240	5,464	2,329,704	2,329,704	12,540,644	1	
2029	275,150	49,727	35	234,609	559,522	1,515,097	3,526	1,518,623	1,518,623	10,920,269	1	
2030	264,611	30,827	25	208,814	504,277	1,002,767	2,460	1,005,227	1,005,227	9,961,168	1	
2031	263,523	21,268	17	194,214	479,022	568,645	1,614	570,259	570,259	9,460,218	1	
2032	265,294	14,144	11	188,292	467,741	366,950	1,050	368,000	368,000	9,368,981	1	
2033	257,556	8,317	8	188,377	454,258	256,039	727	256,766	256,766	9,468,722	1	
2034	247,280	3,867	3	191,349	442,500	167,973	288	168,261	168,261	9,666,214	1	
2035	246,357	3,298	3	196,067	445,724	109,296	244	109,540	109,540	9,940,453	1	
2036	245,808	2,625	3	202,171	450,607	75,678	227	75,906	75,906	10,276,637	1	
2037	246,612	943	1	209,280	456,836	29,976	64	30,040	30,040	10,651,338	1	
2038	251,295	713	1	217,295	469,303	25,393	56	25,449	25,449	11,078,134	1	
2039	245,931	155	0	226,001	472,088	23,653	25	23,678	23,678	11,521,988	1	
2040	247,409	107	0	234,924	482,440	6,621	7	6,628	6,628	11,970,397	1	
2041	246,601	392	0	244,166	491,159	5,819	23	5,843	5,843	12,446,209	1	
2042	245,831	27	0	253,777	499,635	2,612	1	2,613	2,613	12,931,526	1	
2043	245,424	-	-	263,601	509,025	773	-	773	773	13,428,547	1	
2044	245,003	-	-	273,653	518,656	2,429	-	2,429	2,429	13,936,799	1	
2045	243,570	-	-	283,898	527,468	116	-	116	116	14,453,026	1	
2046	243,039	-	-	294,334	537,373	-	-	-	-	14,980,378	1	
2047	243,256	-	-	304,981	548,238	-	-	-	-	15,517,751	1	
2048	241,734	-	-	315,837	557,571	-	-	-	-	16,065,988	1	

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Pro Forma Projections
 High Reclamation Rate

(1) Calendar Year	Revenues				Expenses				(10) Beginning Balance	E B
	(2) Coal Tax	(3) Bond Revenue	(4) Civil Penalties	(5) Interest Income	(6) Total Revenue	(7) Reclamation Expense	(8) Admin Expense	(9) Total Expense		
2023										1
2024	359,607	499,705	300	507,333	1,366,945	-	34,076	34,076	11,835,451	1
2025	334,592	308,588	149	478,728	1,122,057	-	16,049	16,049	13,168,320	1
2026	324,713	204,209	67	462,674	991,664	-	7,101	7,101	14,274,328	1
2027	308,467	130,152	33	430,391	869,043	6,020,939	3,422	6,024,361	15,258,890	1
2028	294,212	73,671	15	311,617	679,515	2,821,966	1,478	2,823,445	10,103,571	1
2029	275,150	49,727	8	180,632	505,517	1,248,631	815	1,249,446	7,959,641	1
2030	264,611	30,827	2	151,754	447,194	601,724	208	601,932	7,215,712	1
2031	263,523	21,268	1	142,767	427,558	259,963	75	260,038	7,060,974	1
2032	265,294	14,144	0	142,895	422,333	143,358	41	143,399	7,228,495	1
2033	257,556	8,317	-	147,359	413,232	36,579	-	36,579	7,507,429	1
2034	247,280	3,867	-	153,915	405,063	13,132	-	13,132	7,884,082	1
2035	246,357	3,298	0	161,601	411,256	7,212	27	7,239	8,276,012	1
2036	245,808	2,625	-	169,560	417,993	-	-	-	8,680,029	1
2037	246,612	943	0	177,781	425,336	-	14	14	9,098,023	1
2038	251,295	713	-	186,214	438,221	4,835	-	4,835	9,523,345	1
2039	245,931	155	-	194,801	440,887	-	-	-	9,956,732	1
2040	247,409	107	-	203,544	451,060	2,433	-	2,433	10,397,619	1
2041	246,601	392	-	212,439	459,432	-	-	-	10,846,245	1
2042	245,831	27	-	221,519	467,377	-	-	-	11,305,677	1
2043	245,424	-	-	230,787	476,211	-	-	-	11,773,054	1
2044	245,003	-	-	240,223	485,226	-	-	-	12,249,265	1
2045	243,570	-	-	249,838	493,407	-	-	-	12,734,491	1
2046	243,039	-	-	259,624	502,662	-	-	-	13,227,898	1
2047	243,256	-	-	269,585	512,841	-	-	-	13,730,561	1
2048	241,734	-	-	279,740	521,473	-	-	-	14,243,402	1

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Pro Forma Projections
 Shock Loss Scenario

(1) Calendar Year	Revenues					Expenses				(10) Beginning Balance	E B
	(2) Coal Tax	(3) Bond Revenue	(4) Civil Penalties	(5) Interest Income	(6) Total Revenue	(7) Reclamation Expense	(8) Admin Expense	(9) Total Expense			
2023											1
2024	359,607	10,960,356	300	507,333	11,827,595	-	34,076	34,076	11,835,451	2	
2025	334,592	-	208	679,010	1,013,809	-	22,333	22,333	23,628,970	2	
2026	324,713	-	138	813,469	1,138,320	107,687	14,558	122,245	24,620,446	2	
2027	308,467	-	93	732,400	1,040,960	3,844,408	9,635	3,854,043	25,636,522	2	
2028	294,212	-	54	595,406	889,672	3,921,296	5,464	3,926,760	22,823,438	1	
2029	275,150	-	35	426,098	701,283	3,999,722	3,526	4,003,248	19,786,350	1	
2030	264,611	-	25	362,707	627,343	4,079,717	2,460	4,082,177	16,484,386	1	
2031	263,523	-	17	295,139	558,679	4,161,311	1,614	4,162,925	13,029,552		
2032	265,294	-	11	224,549	489,853	4,244,537	1,050	4,245,587	9,425,307		
2033	257,556	-	8	150,949	408,513	4,329,428	727	4,330,155	5,669,573		
2034	247,280	-	3	74,175	321,459	4,416,016	288	4,416,304	1,747,930		
2035	246,357	-	3	-	246,360	4,504,337	244	4,504,581	(2,346,916)		
2036	245,808	-	3	-	245,810	4,594,423	227	4,594,651	(6,605,136)	(1)	
2037	246,612	-	1	-	246,613	4,686,312	64	4,686,376	(10,953,977)	(1)	
2038	251,295	-	1	-	251,295	4,780,038	56	4,780,094	(15,393,739)	(1)	
2039	245,931	-	0	-	245,931	4,875,639	25	4,875,664	(19,922,538)	(2)	
2040	247,409	-	0	-	247,409	4,973,152	7	4,973,159	(24,552,271)	(2)	
2041	246,601	-	0	-	246,601	5,072,615	23	5,072,638	(29,278,021)	(3)	
2042	245,831	-	0	-	245,831	5,174,067	1	5,174,068	(34,104,058)	(3)	
2043	245,424	-	-	-	245,424	5,277,548	-	5,277,548	(39,032,295)	(4)	
2044	245,003	-	-	-	245,003	5,383,099	-	5,383,099	(44,064,419)	(4)	
2045	243,570	-	-	-	243,570	5,490,761	-	5,490,761	(49,202,516)	(5)	
2046	243,039	-	-	-	243,039	5,600,577	-	5,600,577	(54,449,707)	(5)	
2047	243,256	-	-	-	243,256	5,712,588	-	5,712,588	(59,807,246)	(6)	
2048	241,734	-	-	-	241,734	4,573,501	-	4,573,501	(65,276,577)	(6)	

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Coal Production

(1) Calendar	(2)		(3)		(4)		(5) Total	(6) USEIA Appalachian Region Projection	(7) Assoc. Fac.	(8) Tax Rec Surface
	Assoc. Fac.	Surface	Surface	Underground	Underground	Underground				
2014	-	526,414.19	3,450.22	3,450.22	529,864.41				21,056.56	
2015	1,196,519.08	1,965,942.27	66,486.15	66,486.15	3,228,947.50			17,947.80	78,637.71	
2016	6,353,365.62	2,751,935.43	2,732,492.47	2,732,492.47	11,837,793.52			95,300.53	110,077.39	
2017	9,588,575.82	3,253,260.89	6,167,217.79	6,167,217.79	19,009,054.50			143,828.69	130,130.46	
2018	8,878,239.82	2,994,824.67	5,907,457.02	5,907,457.02	17,780,521.51			133,173.65	119,792.99	
2019	9,275,247.96	3,047,325.96	5,995,020.58	5,995,020.58	18,317,594.50			139,128.77	121,893.02	
2020	7,499,369.09	2,521,308.68	4,291,639.44	4,291,639.44	14,312,317.21			112,490.60	100,852.39	
2021	8,581,495.17	2,514,391.93	5,129,742.16	5,129,742.16	16,225,629.26		153.32	128,722.44	100,575.71	
2022	7,499,815.28	2,517,195.21	4,677,211.06	4,677,211.06	14,694,221.55		153.32	112,497.24	100,687.84	
2023	7,169,727.20	2,582,121.16	4,615,451.01	4,615,451.01	14,367,299.37		137.89	107,545.93	103,284.84	
2024	7,699,206.05	2,521,156.68	4,775,746.51	4,775,746.51	14,996,109.24		150.27	115,488.09	100,846.27	
2025	7,163,639.61	2,345,781.86	4,443,539.58	4,443,539.58	13,952,961.05		139.81	107,454.59	93,831.27	
2026	6,952,135.17	2,276,523.31	4,312,345.33	4,312,345.33	13,541,003.82		135.69	104,282.03	91,060.93	
2027	6,604,290.45	2,162,619.23	4,096,580.46	4,096,580.46	12,863,490.14		128.90	99,064.36	86,504.77	
2028	6,299,105.74	2,062,684.44	3,907,277.20	3,907,277.20	12,269,067.39		122.94	94,486.59	82,507.38	
2029	5,890,983.69	1,929,042.14	3,654,122.85	3,654,122.85	11,474,148.68		114.98	88,364.76	77,161.69	
2030	5,665,337.42	1,855,152.75	3,514,156.56	3,514,156.56	11,034,646.73		110.57	84,980.06	74,206.11	
2031	5,642,043.72	1,847,525.07	3,499,707.68	3,499,707.68	10,989,276.47		110.12	84,630.66	73,901.00	
2032	5,679,952.99	1,859,938.72	3,523,222.46	3,523,222.46	11,063,114.17		110.86	85,199.29	74,397.55	
2033	5,514,291.29	1,805,691.69	3,420,464.03	3,420,464.03	10,740,447.01		107.62	82,714.37	72,227.67	
2034	5,294,292.04	1,733,651.46	3,284,000.53	3,284,000.53	10,311,944.03		103.33	79,414.38	69,346.06	
2035	5,274,528.20	1,727,179.65	3,271,741.20	3,271,741.20	10,273,449.05		102.94	79,117.92	69,087.19	
2036	5,262,759.20	1,723,325.81	3,264,440.99	3,264,440.99	10,250,526.00		102.71	78,941.39	68,933.03	
2037	5,279,988.76	1,728,967.75	3,275,128.34	3,275,128.34	10,284,084.85		103.05	79,199.83	69,158.71	
2038	5,380,238.63	1,761,795.24	3,337,312.41	3,337,312.41	10,479,346.28		105.01	80,703.58	70,471.81	
2039	5,265,400.15	1,724,190.61	3,266,079.15	3,266,079.15	10,255,669.91		102.77	78,981.00	68,967.62	
2040	5,297,041.67	1,734,551.84	3,285,706.10	3,285,706.10	10,317,299.61		103.38	79,455.63	69,382.07	
2041	5,279,744.88	1,728,887.89	3,274,977.06	3,274,977.06	10,283,609.82		103.05	79,196.17	69,155.52	
2042	5,263,260.34	1,723,489.92	3,264,751.85	3,264,751.85	10,251,502.11		102.72	78,948.91	68,939.60	
2043	5,254,547.06	1,720,636.69	3,259,347.08	3,259,347.08	10,234,530.83		102.55	78,818.21	68,825.47	

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Net Reclamation Cost

(1) Calendar Year	(2) Reclamation <u>Expense</u>	(3) 3-Year <u>Delay</u>	(4) Admin <u>Expense</u>	(5) Total <u>Expense</u>	(6) Inflated <u>Reclamation</u>	(7) Inflated <u>Admin</u>	(8) Inflated <u>Total</u>	(9) Discounted <u>Expense</u>
2024	3,244,445	-	33,083	33,083	-	34,076	34,076	32,675
2025	2,074,528	-	21,154	21,154	-	22,333	22,333	20,625
2026	1,325,802	-	13,519	13,519	-	14,558	14,558	13,006
2027	860,277	3,244,445	8,772	3,253,218	3,563,706	9,635	3,573,342	3,102,036
2028	478,276	2,074,528	4,877	2,079,405	2,324,240	5,464	2,329,704	1,973,922
2029	302,583	1,325,802	3,085	1,328,887	1,515,097	3,526	1,518,623	1,261,476
2030	206,987	860,277	2,111	862,387	1,002,767	2,460	1,005,227	818,641
2031	133,130	478,276	1,358	479,634	568,645	1,614	570,259	455,303
2032	84,926	302,583	866	303,449	366,950	1,050	368,000	288,056
2033	57,651	206,987	588	207,575	256,039	727	256,766	197,045
2034	22,388	133,130	228	133,359	167,973	288	168,261	126,594
2035	18,593	84,926	190	85,116	109,296	244	109,540	80,798
2036	16,980	57,651	173	57,824	75,678	227	75,906	54,891
2037	4,660	22,388	48	22,436	29,976	64	30,040	21,297
2038	4,015	18,593	41	18,634	25,393	56	25,449	17,689
2039	1,767	16,980	18	16,998	23,653	25	23,678	16,135
2040	513	4,660	5	4,665	6,621	7	6,628	4,428
2041	1,579	4,015	16	4,031	5,819	23	5,843	3,827
2042	74	1,767	1	1,768	2,612	1	2,613	1,678
2043	-	513	-	513	773	-	773	487
2044	-	1,579	-	1,579	2,429	-	2,429	1,499
2045	-	74	-	74	116	-	116	70
2046	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-
Total	8,839,175	8,839,175	90,132	8,929,307	10,047,784	96,380	10,144,164	8,492,180

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Net Reclamation Cost - High Reclamation Rate

(1) Calendar Year	(2) Reclamation Expense	(3) 3-Year Delay	(4) Admin Expense	(5) Total Expense	(6) Inflated Reclamation	(7) Inflated Admin	(8) Inflated Total	(9) Discounted Expense
2024	5,481,543	-	33,083	33,083	-	34,076	34,076	32,675
2025	2,518,780	-	15,202	15,202	-	16,049	16,049	14,822
2026	1,092,628	-	6,594	6,594	-	7,101	7,101	6,344
2027	516,220	5,481,543	3,116	5,484,658	6,020,939	3,422	6,024,361	5,229,778
2028	218,650	2,518,780	1,320	2,520,100	2,821,966	1,478	2,823,445	2,392,261
2029	118,211	1,092,628	713	1,093,342	1,248,631	815	1,249,446	1,037,879
2030	29,571	516,220	178	516,399	601,724	208	601,932	490,203
2031	10,408	218,650	63	218,713	259,963	75	260,038	207,618
2032	5,604	118,211	34	118,245	143,358	41	143,399	112,247
2033	-	29,571	-	29,571	36,579	-	36,579	28,071
2034	-	10,408	-	10,408	13,132	-	13,132	9,880
2035	3,540	5,604	21	5,625	7,212	27	7,239	5,340
2036	-	-	-	-	-	-	-	-
2037	1,712	-	10	10	-	14	14	10
2038	-	3,540	-	3,540	4,835	-	4,835	3,360
2039	-	-	-	-	-	-	-	-
2040	-	1,712	-	1,712	2,433	-	2,433	1,626
2041	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-
2045	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-
Total	9,996,868	9,996,868	60,335	10,057,203	11,160,772	63,308	11,224,079	9,572,116

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Net Reclamation Cost - Low Reclamation Rate

(1) Calendar Year	(2) Reclamation Expense	(3) 3-Year Delay	(4) Admin Expense	(5) Total Expense	(6) Inflated Reclamation	(7) Inflated Admin	(8) Inflated Total	(9) Discounted Expense
2024	2,136,973	-	33,083	33,083	-	34,076	34,076	32,675
2025	1,672,758	-	25,897	25,897	-	27,340	27,340	25,250
2026	1,244,727	-	19,270	19,270	-	20,751	20,751	18,539
2027	972,311	2,136,973	15,053	2,152,025	2,347,256	16,534	2,363,790	2,052,018
2028	674,733	1,672,758	10,446	1,683,204	1,874,108	11,703	1,885,811	1,597,819
2029	422,860	1,244,727	6,546	1,251,273	1,422,446	7,481	1,429,927	1,187,799
2030	359,354	972,311	5,563	977,874	1,133,358	6,485	1,139,843	928,269
2031	250,338	674,733	3,876	678,609	802,222	4,608	806,830	644,185
2032	228,499	422,860	3,537	426,398	512,813	4,290	517,103	404,768
2033	197,121	359,354	3,052	362,405	444,513	3,775	448,288	344,021
2034	89,091	250,338	1,379	251,717	315,856	1,740	317,596	238,948
2035	70,870	228,499	1,097	229,597	294,068	1,412	295,480	217,950
2036	69,088	197,121	1,070	198,191	258,759	1,404	260,163	188,137
2037	48,053	89,091	744	89,835	119,288	996	120,284	85,278
2038	38,143	70,870	591	71,461	96,789	806	97,596	67,836
2039	43,273	69,088	670	69,758	96,242	933	97,175	66,219
2040	11,120	48,053	172	48,225	68,278	245	68,523	45,779
2041	44,482	38,143	689	38,831	55,281	998	56,279	36,861
2042	32,422	43,273	502	43,775	63,971	742	64,713	41,555
2043	11,067	11,120	171	11,291	16,767	258	17,026	10,718
2044	9,675	44,482	150	44,632	68,414	230	68,645	42,368
2045	12,161	32,422	188	32,610	50,863	295	51,158	30,956
2046	15,093	11,067	234	11,301	17,709	374	18,083	10,727
2047	17,812	9,675	276	9,951	15,791	450	16,241	9,446
2048	3,563	12,161	55	12,216	20,246	92	20,338	11,597
Total	8,675,587	8,639,118	134,310	8,773,428	10,095,039	148,020	10,243,059	8,339,717

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Cost by Company

(1) <u>Company</u>	(2) <u>Number of Permits</u>	(3) <u>Bonded Acres</u>	(4) <u>Total Bond</u>	(5) <u>Total Liability</u>	(6) <u>Net Cost*</u>
A & G COAL CORPORATION	19	12,529	29,742,825	190,437,490	160,694,660
RED RIVER COAL COMPANY, INC.	16	4,328	5,662,600	88,000,418	82,389,118
PARAMONT CONTURA, LLC	12	6,840	18,014,100	99,134,980	81,120,880
VIRGINIA FUEL CORPORATION	10	4,640	10,953,975	83,653,220	72,699,245
THE BLACK DIAMOND COMPANY	32	5,436	15,055,000	84,985,910	70,520,510
CLINTWOOD JOD, LLC	10	3,468	11,116,600	59,108,408	47,997,908
RUSSELL COUNTY RECLAMATION, LLC	1	972	2,686,800	29,150,100	26,463,300
NORTON COAL COMPANY, LLC	3	2,071	2,906,300	27,446,580	24,540,280
BUCHANAN MINERALS, LLC	1	833	2,505,000	25,207,325	22,702,325
MEG-LYNN LAND COMPANY, INC.	2	404	1,030,000	12,106,800	11,076,800
MID-VOL COAL SALES, INC.	2	905	3,400,400	12,211,695	9,156,395
BADEN RECLAMATION COMPANY, INC.	1	566	1,698,000	7,499,500	5,801,500
J. W. CONSTRUCTION CO., INC.	3	410	996,300	5,430,248	4,433,948
RAMACO RESOURCES LAND HOLDINGS, LLC	1	375	1,416,200	4,970,075	3,553,875
APPALACHIAN DEVELOPMENT, LLC	1	303	912,000	4,021,243	3,109,243
JUSTICE LOW SEAM MINING, INC.	1	300	900,000	3,975,000	3,075,000
COAL TECHNOLOGY INTERNATIONAL, LLC	2	100	201,600	3,029,023	2,827,423
TRUE ENERGY FUELS, LLC	1	252	684,000	3,339,000	2,655,000
RIDGETOP DEVELOPMENT LLC	3	202	438,300	2,676,235	2,237,935
THE BANNER COMPANY	2	210	1,519,400	3,517,210	1,997,810
AMBROSE BRANCH COAL COMPANY, INC	1	179	450,800	2,371,750	1,920,950
HAROLD KEENE COAL COMPANY, INC.	1	153	462,000	2,030,563	1,568,563
KEN ENERGY CORPORATION	1	146	438,000	1,934,500	1,496,500
WYNNLY, INC.	1	48	144,000	1,440,000	1,296,000
COKING COAL LLC	1	23	120,000	704,825	584,825
K. M. H. ENERGY CORPORATION	1	48	153,500	632,953	479,453
IRON MOUNTAIN COLLIERIES LLC	1	47	141,000	616,655	475,655
BIG D ENTERPRISES, INC.	1	46	156,000	610,560	454,560
CANE PATCH MINING COMPANY, INC.	1	36	100,000	470,508	370,508
STANDARD BANNER COAL CORPORATION	1	4	40,000	120,698	80,698
WELLMORE ENERGY COMPANY, LLC	1	15	441,400	467,968	26,568

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Shock Loss Expense Scenario

(1) Calendar Year	(2) Reclamation Expense	(3) 3-Year Delay	(4) Inflated Expense	(5) Discounted Expense
2024	3,500,000	-	-	-
2025	3,500,000	-	-	-
2026	3,500,000	100,000	107,687	96,208
2027	3,500,000	3,500,000	3,844,408	3,337,350
2028	3,500,000	3,500,000	3,921,296	3,322,454
2029	3,500,000	3,500,000	3,999,722	3,322,454
2030	3,500,000	3,500,000	4,079,717	3,322,454
2031	3,500,000	3,500,000	4,161,311	3,322,454
2032	3,500,000	3,500,000	4,244,537	3,322,454
2033	3,500,000	3,500,000	4,329,428	3,322,454
2034	3,500,000	3,500,000	4,416,016	3,322,454
2035	3,500,000	3,500,000	4,504,337	3,322,454
2036	3,500,000	3,500,000	4,594,423	3,322,454
2037	3,500,000	3,500,000	4,686,312	3,322,454
2038	3,500,000	3,500,000	4,780,038	3,322,454
2039	3,500,000	3,500,000	4,875,639	3,322,454
2040	3,500,000	3,500,000	4,973,152	3,322,454
2041	3,500,000	3,500,000	5,072,615	3,322,454
2042	3,500,000	3,500,000	5,174,067	3,322,454
2043	3,500,000	3,500,000	5,277,548	3,322,454
2044	3,500,000	3,500,000	5,383,099	3,322,454
2045	2,847,159	3,500,000	5,490,761	3,322,454
2046	-	3,500,000	5,600,577	3,322,454
2047	-	3,500,000	5,712,588	3,322,454
2048	-	2,747,159	4,573,501	2,607,803
Total	76,347,159	76,347,159	103,802,780	72,490,439

Note: Shock Loss Amount = Average net reclamation cost among companies for which the net cost exceeds the current fund balance.

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Inflation and Investment Yields

(1) Calendar <u>Year</u>	(2) Cumulative <u>Inflation</u>	(3) Investment <u>Yield</u>	(4) Discount <u>Factor</u>
2024	1.030	4.29%	0.96
2025	1.056	3.83%	0.92
2026	1.077	3.37%	0.89
2027	1.098	2.91%	0.87
2028	1.120	2.46%	0.85
2029	1.143	2.00%	0.83
2030	1.166	2.00%	0.81
2031	1.189	2.00%	0.80
2032	1.213	2.00%	0.78
2033	1.237	2.00%	0.77
2034	1.262	2.00%	0.75
2035	1.287	2.00%	0.74
2036	1.313	2.00%	0.72
2037	1.339	2.00%	0.71
2038	1.366	2.00%	0.70
2039	1.393	2.00%	0.68
2040	1.421	2.00%	0.67
2041	1.449	2.00%	0.65
2042	1.478	2.00%	0.64
2043	1.508	2.00%	0.63
2044	1.538	2.00%	0.62
2045	1.569	2.00%	0.61
2046	1.600	2.00%	0.59
2047	1.632	2.00%	0.58
2048	1.665	2.00%	0.57

Notes: Inflation rate assumes 3% in 2024, 2.5% in 2025, and 2% every year thereafter.
 Investment yield based on duration-matched daily treasury yield as of February 29, 2024
 and leveling out to 2% by 2029.

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Average Land Reclamation Expenses

	<u>Surface</u>	<u>Underground</u>	<u>Other</u>
(1) WV Cost Per Acre	3,235	13,295	9,310
(2) OH Cost Per Acre	3,028	42,505	10,552
(3) Trended Prior Study VA Cost Per Acre	5,953	14,831	12,723
(4) Trended Prior Study WV Cost Per Acre	3,817	17,465	12,612
(5) Trended Prior Study OH Cost Per Acre	9,507	11,723	18,486
(6) Recent AML & Forfeiture Bids	16,663	16,663	16,663
(7) Selected Cost Per Acre	13,250	30,250	30,000

Reserve Analysis as of February 29, 2024
 Virginia Department of Energy Coal Surface Mining Reclamation Fund
 Forfeiture Rate Adjustment Factors

(1)	(2)
<u>Land Status</u>	<u>Factor</u>
Pending Phase 1 Release	1.000
Pending Phase 2 Release	0.667
Pending Phase 3 Release	0.333
<u>Operation Status Code</u>	<u>Factor</u>
ACT/NOT PRDCNG	1.250
RECLAIMED/ACT.	1.000
ACTIVE	1.000
INACTIVE	1.500
TEMP CESSATION	1.250
PCESS-NOT PROD	1.250
NOT STARTED	1.000
NOT INSPECTABLE	1.250

Reserve Analysis as of February 29, 2024

Virginia Department of Energy Coal Surface Mining Reclamation
 Forfeiture and Release Rates by Mine Type and Age of Per

Age	Surface		Underground	
	Release	Forfeiture	Release	Forfeiture
1	0.0000	0.0000	0.0050	0.0000
2	0.0014	0.0007	0.0081	0.0000
3	0.0049	0.0015	0.0110	0.0001
4	0.0078	0.0021	0.0137	0.0001
5	0.0103	0.0025	0.0162	0.0001
6	0.0123	0.0028	0.0185	0.0001
7	0.0140	0.0029	0.0206	0.0002
8	0.0154	0.0030	0.0226	0.0002
9	0.0166	0.0030	0.0244	0.0002
10	0.0176	0.0030	0.0260	0.0002
11	0.0187	0.0029	0.0275	0.0002
12	0.0196	0.0029	0.0288	0.0002
13	0.0205	0.0029	0.0299	0.0002
14	0.0214	0.0028	0.0309	0.0002
15	0.0222	0.0028	0.0318	0.0002
16	0.0229	0.0027	0.0325	0.0002
17	0.0236	0.0026	0.0331	0.0002
18	0.0242	0.0026	0.0335	0.0001
19	0.0248	0.0025	0.0338	0.0001
20	0.0253	0.0024	0.0340	0.0001
21	0.0258	0.0023	0.0341	0.0001
22	0.0262	0.0023	0.0341	0.0001
23	0.0265	0.0022	0.0340	0.0001
24	0.0267	0.0021	0.0337	0.0001
25	0.0269	0.0020	0.0334	0.0001
26	0.0271	0.0019	0.0330	0.0001
27	0.0272	0.0018	0.0325	0.0001
28	0.0272	0.0017	0.0319	0.0001
29	0.0271	0.0016	0.0312	0.0001