REPORT OF THE
SPECIAL RECLAMATION FUND
ADVISORY COUNCIL

February 8, 2024

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EXECUTIVE SUMMARY

The Special Reclamation Fund Advisory Council (the "SRFAC") was established by the Legislature in 2001 to ensure the effective, efficient, and financially stable operation of the Special Reclamation Fund (the Fund). (W.Va. Code § 22-1-17). According to W.Va. Code § 22-1-17 the SRFAC shall consist of eight members, including the Secretary of the West Virginia Department of Environmental Protection (WVDEP) or his or her designee, the Treasurer of the State of West Virginia or his or her designee, the Director of the National Mine Land Reclamation Center at West Virginia University and five members to be appointed by the governor with the advice and consent of the Senate.

The Fund is designated by the Legislature for the reclamation and rehabilitation of lands subject to permitted coal mining operations and abandoned after 1977, where the bond posted is insufficient to cover the cost of reclamation. The Fund is presently funded by a tax of 27.9 cents per ton of clean coal mined in West Virginia. From this revenue, funds based on a tax rate of 15 cents per ton are being paid into the Special Reclamation Water Trust Fund (SRWTF), while funds based on a tax rate of 12.9 cents per ton are being paid into the Fund. According to W.Va. Code § 22-3-11**, "**Beginning with the tax period commencing on July 1, 2009, and every two years thereafter, the special reclamation tax shall be reviewed by the Legislature to determine whether the tax should be continued: *Provided,* That the tax may not be reduced until the Fund and SRWTF have sufficient moneys to meet the reclamation responsibilities of the state established in this section."

The SRWTF was created "for the purpose of assuring a reliable source of capital to construct, operate, and maintain water treatment systems on forfeited sites." (W.Va. Code § 22-3-11).

The Secretary of the WVDEP is required to conduct formal actuarial studies every two years and conduct informal reviews annually on the Fund and SRWTF. The SRFAC is also required to make a report to the Legislature every year on the financial condition of the Fund. (W.Va. Code § 22-1-17). The report is to include: "A recommendation as to whether or not any adjustments to the special reclamation tax should be made considering the cost, timeliness, and adequacy of bond forfeiture reclamation, including water treatment and a discussion of the SRFAC 's required study issues."

In accordance with the statutory requirements, the SRFAC submits the following:

1. Recommendation:

Based upon conclusions drawn from information included in this report, the SRFAC makes the following recommendations to the Legislature:

The SRFAC recommends that the present 12.9 cent per ton tax dedicated to the Fund remain in force and that the tax dedicated to the SRWTF remain at 15 cents per ton. It was previously established by the Council that the Fund would cover all costs for both land reclamation and water treatment through June 2018. Then starting in July 2018, the SRWTF would begin covering the cost for water treatment—both water capital costs and ongoing water treatment costs. Following reviews of the financial status and investment earnings of both funds it was the consensus of the Council to continue paying for all reclamation costs out of the Fund to allow the SRWTF to continue building assets while earning higher yields. It was also agreed that fund transfers from the SRWTF to the Fund would occur, as needed, to maintain a Fund balance of $10,000,000.

The SRFAC further recommends that the State Legislature form a panel to examine the elements of our State code that result in uncontrolled liabilities, and to propose a State legislative initiative to rationalize water quality regulation to meet the conditions of the Federal Clean Water Act (CWA) while adding rationality and certainty to the process.

The SRFAC recommends that the Legislature continue to examine the implications of the recent court rulings and subsequent lawsuit settlements on the Special Reclamation Fund, Abandoned Mine Lands, and voluntary efforts by citizen-led watershed groups to address historic mining reclamation related liabilities. The SRFAC further recommends that the Legislature examine the mine reclamation and bonding programs of other states as implemented in Tennessee, by the federal Office of Surface Mining to determine whether the statute and regulations creating the Fund and SRWTF in West Virginia have inappropriately interpreted SMCRA to require long-term CWA liabilities. The SRFAC further recommends the Legislature examine the separate and distinct authorities of the CWA in assessing the eligibility of future forfeitures for transfer of liabilities to the SRWTF. The SRFAC is concerned about default transfer of water treatment liability to the SRWTF when opportunities exist to pursue responsible parties under the CWA per the requirements of an NPDES (CWA Section 402) permit.

2023 SRFAC Study Issues

- Review of the current investment strategy
- Continue review of DMR database and improvement to functionality. A priority addition is to include a data field that indicates whether an active permit is treating AMD, or other water pollutants, as part of the effort to compile water management and treatment costs on active sites.
- Continue to improve upon the active mine pollutant inventory.
- Consensus Coal Forecast and Actuarial Modeling Improvements for 2023 Study

2023 Notable Projects:

- Southwestern Energy (SWN) partnership for Operation & Maintenance ongoing for two sites.
- Rare Earth Elements Extraction Plant combined with new Acid Mine Drainage Treatment facility is now online at site A34, near Bismarck WV.
- In 2022, a study was undertaken to compare the costs and benefits of the watershed strategy for treating AMD vs point source treatment within Muddy Creek (Ziemkiewicz, Risch). Preliminary results indicate that the 10year capX + opX costs could be around $ 7,280,000 less using the watershed strategy and that stream recovery totaled 19.2 miles. On the other hand, previous experience using a point source (NPDES) treatment strategy resulted in much higher cost while recovering zero stream miles (table 1). Costs to the SRWTF were significantly reduced by a voluntary contribution by Southwestern Energy Co. However, even without that contribution, costs of the watershed strategy were still lower than the point source treatment strategy. A more in-depth analysis is underway, in 2024, to calculate the cost savings with more precision. That work will incorporate recent O&M cost data for the system as well as updated capital costs for a new pump line.

Table 1. Summary of costs and benefits related to point source vs. watershed level treatment strategies. The example reflects actual costs for implementing the Muddy Ck. Project and includes the voluntary contributions by Southwestern Energy Co.

	Strategy		
Cost ($ million)	Point Source	Watershed *	Watershed **
CapX	$ 12,500,000	$ 15,920,000	$ 15,920,000
Southwestern Energy Contribution		$ (2,500,000)	
Net CapX	$ 12,500,000	$ 13,420,000	$ 15,920,000
OpX per year	$ 1,000,000	$ 530,000	$ 530,000
Southwestern Energy Contribution		$ (350,000)	
Net OpX (10 yrs)	$ 10,000,000	$ 1,800,000	$ 5,300,000
Total costs over 10 years	**$ 22,500,000**	**$ 15,220,000**	**$ 21,220,000**
Savings		$ 7,280,000	$ 1,280,000
Stream Miles Recovered			
Muddy Ck	0	3.20	3.20
Cheat River	0	16.00	16.00
Total stream recovery	**0**	**19.20**	**19.20**

* with SWE contribution
** without SWE contribution

Membership Status of the Special Reclamation Fund Advisory Council

Matthew Butler-Deputy Director for Division of Land Restoration is serving as the member representing the Cabinet Secretary of the WVDEP. Lindsay Marchio serves as the member representing the Treasurer of the State of West Virginia. Dr. Paul Ziemkiewicz serves as the member representing the Director of the National Mine Land Reclamation Center at West Virginia University. Christine Risch, Marshall University, Center for Business and Economic Research, serves as the Actuary/Economist member. Jason Bostic serves as the member representing the interests of the coal industry. John Morgan served as the member representing the interest of environmental protection organizations, until November 2023. DEP is pursuing a replacement candidate to fill the position. As of January 16, 2024, an appointment letter was received from the Governor's office and is

awaiting Senate confirmation to appoint James Kotcon. Ronald Pauley serves as the member representing the interests of coal miners. Christopher Pence serves as the member representing the interests of the general public.

BACKGROUND ON THE SPECIAL RECLAMATION FUND

In 2001 the legislation establishing the SRFAC also increased the tax on clean coal mined in West Virginia, from three to seven cents per ton (the "Continuing Tax") and levied an additional seven cents per ton (the "Temporary Tax"), to be deposited into the Fund. The revenues of the Fund were designated to pay for reclamation on post-1977 bond-forfeited (permit revoked) sites.

The 2001 legislation provided for the Temporary Tax to be in effect for thirty-nine months. As a result of a 2005 actuarial report finding that the expiration of the Temporary Tax would result in nearly immediate insolvency of the Fund, the Temporary Tax was extended by the Legislature in 2005, for an additional eighteen months. A 2007 actuarial study commissioned by the SRFAC found that the failure to extend the Temporary Tax again would result in insolvency of the Fund. Accordingly, in 2008 the Legislature, through SB 751, created the SRWTF and enacted a temporary, twelve-month tax of 7.4 cents which was to be allocated between the Fund and a SRWTF. Twelve and nine-tenths cents was dedicated to the Fund and 1.5 cents was deposited into the SRWTF. An updated actuarial study in 2008 concluded that terminating the temporary tax would result in insolvency within a few years. In response, during the 2009 legislative session, the Legislature amended W.Va. Code § 22-3-11 to remove the expiration date for the Temporary Tax and provided instead for biennial review of the Tax by the Legislature. (Acts of the Legislature 2009, chapter 216).

Based upon projections under the 2011 Actuarial Analysis performed by Pinnacle Actuarial Resources, Inc. the Fund was found to be sufficiently funded under the existing 12.9 cent tax. However, the SRFAC was concerned that as the SRWTF began making payments for water capital and ongoing water treatment in Fiscal Year 2019, as projected, the SRWTF would fall into a deficit position in the second year of operation-2020. (2011 Actuarial Valuation, page 3). Declining coal production projected by the 2011 Consensus Coal Production Forecast and the significant increase in water treatment costs resulting from court rulings in two cases were contributing factors in the projected insolvency of the SRWTF. Accordingly, in 2012 the Legislature increased the special reclamation tax to 27.9 cents per ton, 15 cents of which was to be deposited into the SRWTF.

Based upon projections under the 2013 Actuarial Analysis performed by Pinnacle Actuarial Resources, Inc. the Fund was projected to be over 100 percent funded using a 20-year cash flow basis and 95.7 percent funded

using a 35-year cash flow basis. The SRWTF was (and is today) accumulating 15 cents per ton coal tax revenue and interest and was projected by the 2013 Actuarial Valuation to be 150.4 percent funded using a 20-year cash flow basis and 89.9 percent funded using a 35-year cash flow basis.

Based on the 2015 Actuarial Analysis conducted by Taylor & Mulder, the Fund was projected to fall to a low of $51.5 million in 2018. This was due to paying all reclamation cost for both land and water as well as operation and maintenance cost associated with water treatment. The Fund was projected to then recover to $187.5 million slowly by the end of the twenty-year study period, at which point an $8.2 million liability would remain. The SRWTF was expected to accumulate approximately $120 million by 2018 before beginning to support water reclamation costs in 2019 *(However, it should be noted that as of December 31, 2017 the balance in the SRWTF had only reached $104 million)*. Afterwards, the SRWTF was projected to show gains, reaching $289.8 million by the end of the twenty-year study period with a $110.5 million liability remaining. Both funds combined were projected to total approximately $477.3 million at the end of the twenty-year study period with a total remaining liability of $118.7 million.

Based on the 2017 Actuarial Analysis conducted by Pinnacle Actuarial Resources, Inc, the results indicated that on a present value basis the Fund is 97.3% funded over a twenty-year projection and 93.6% funded over a thirty five-year projection period but indicated that the fund would go into a negative balance in 2021. The SRWTF is 162.6% funded over a twenty-year projection, 151.4% funded over a thirty five-year projection period and is fully funded throughout the entire projection period. Combined the two funds are 123.4% and 115.8% funded over twenty and thirty five-year projections respectively, and fully funded throughout the entire projection period. Pinnacle determined that a transfer of $38 million in assets from the SRWTF to the Fund would keep the Fund in a positive balance position throughout the projection period without causing the SRWTF to move into a negative balance.

A change starting in 2019, only a twenty-year analysis is being performed due to a new study performed every two years.

Taylor and Mulder 2019 projections of revenues and expenses to the Funds imply that the Funds will be solvent on a cash basis through 2039.

The chart below (Figure 1) shows a simplified cash flow projection for the SRF and WTF combined over the next 20 years. Note that these projections assume that money will be transferred from the Water Trust Fund to the Special Reclamation Fund to maintain a minimum fund balance of $10,000,000.

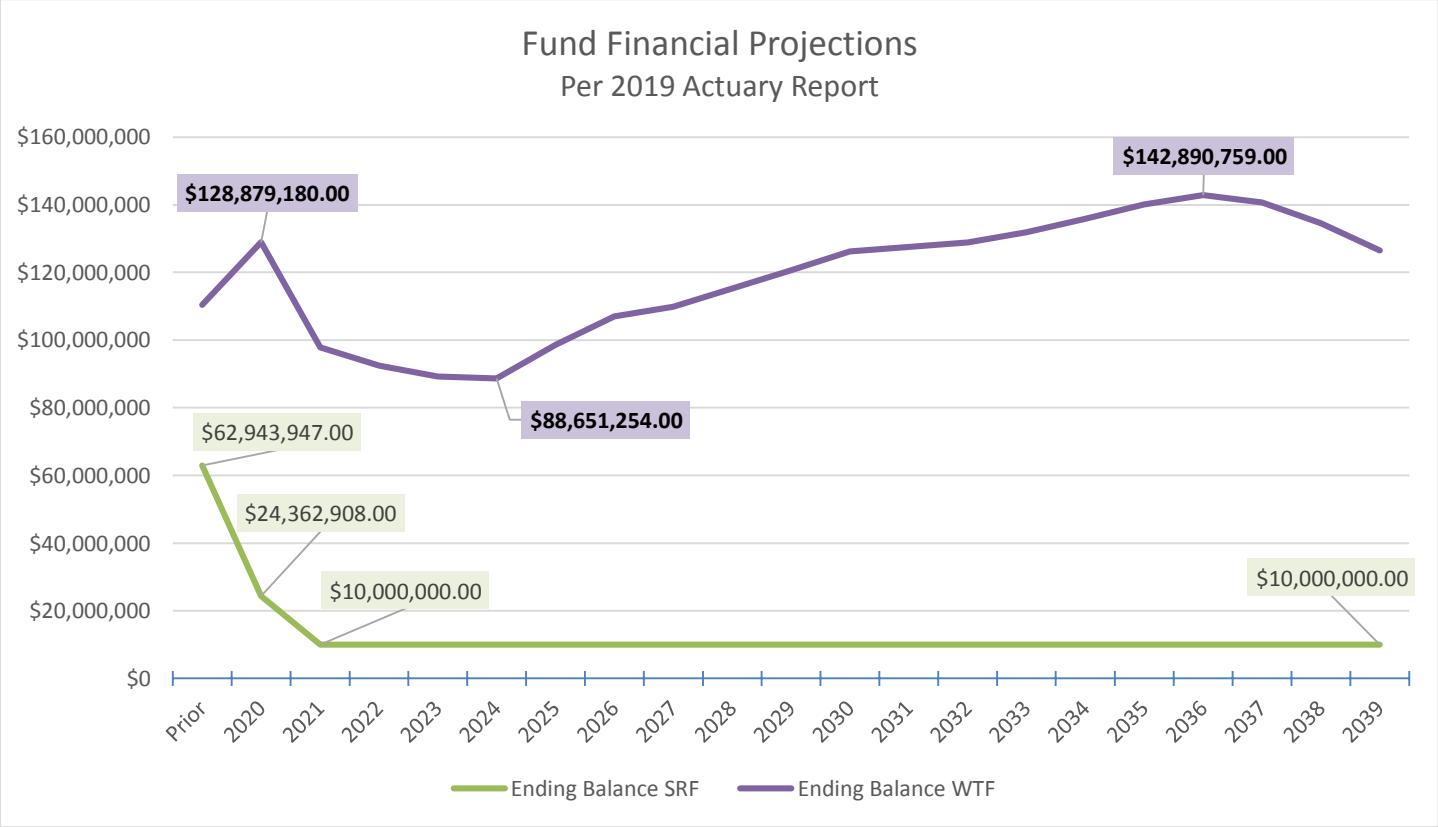


Figure 1

Taylor and Mulder 2021 projections of revenues and expenses to the Funds imply that the Funds will be solvent on a cash basis through 2039. Note that these projections assume that money will be transferred from the Water Trust Fund to the Special Reclamation Fund to maintain a minimum fund balance of $10,000,000.

The chart below (Figure 2) shows a simplified cash flow projection for the SRF and WTF combined over the next 20 years.

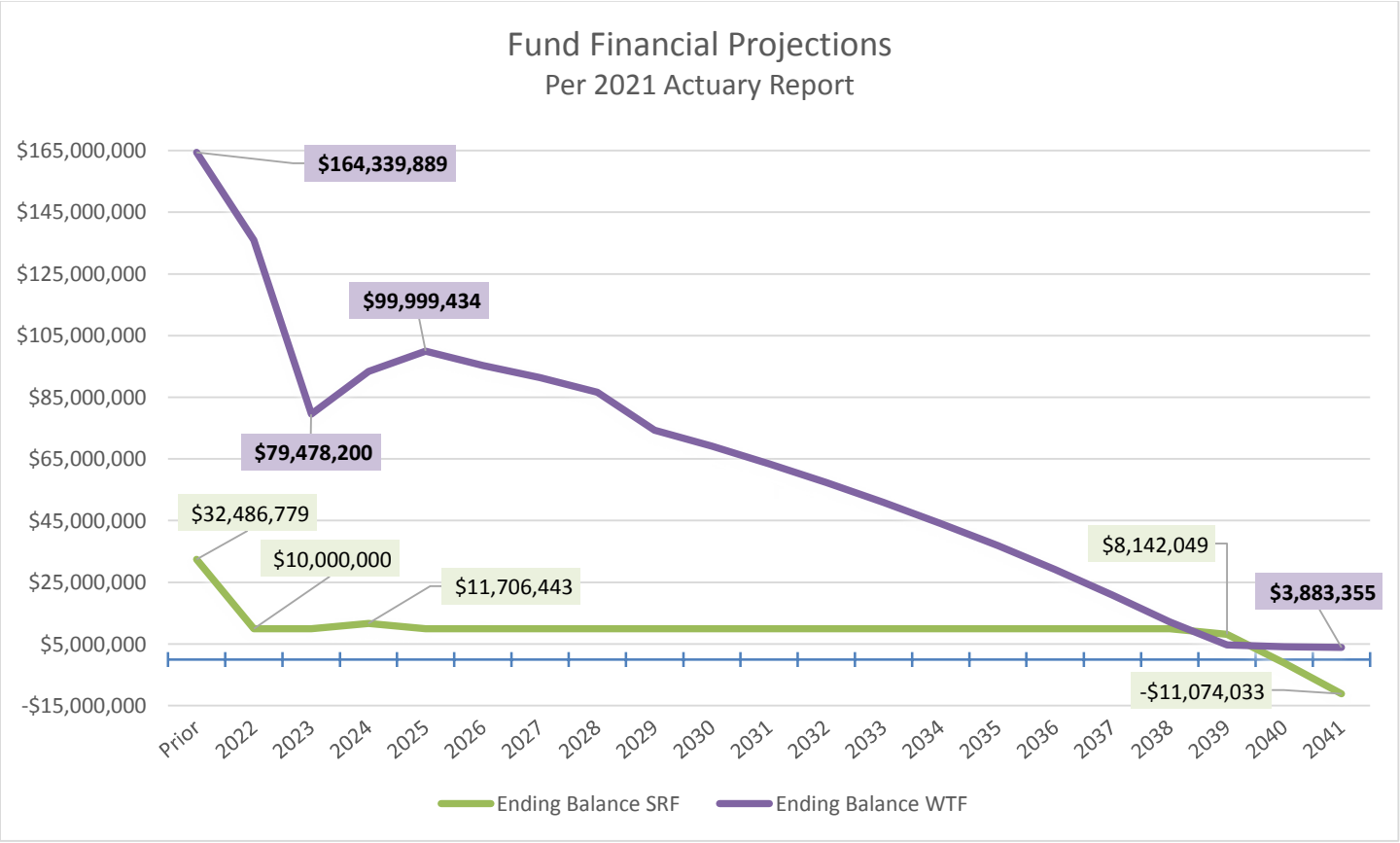


Figure 2

Taylor and Mulder 2023 projections of revenues and expenses to the Funds imply that the Funds will be solvent on a cash basis through 2043. Note that these projections assume that money will be transferred from the Water Trust Fund to the Special Reclamation Fund to maintain a minimum fund balance of $10,000,000.

The chart below (Figure 3) shows a simplified cash flow projection for the SRF and WTF combined over the next 20 years.

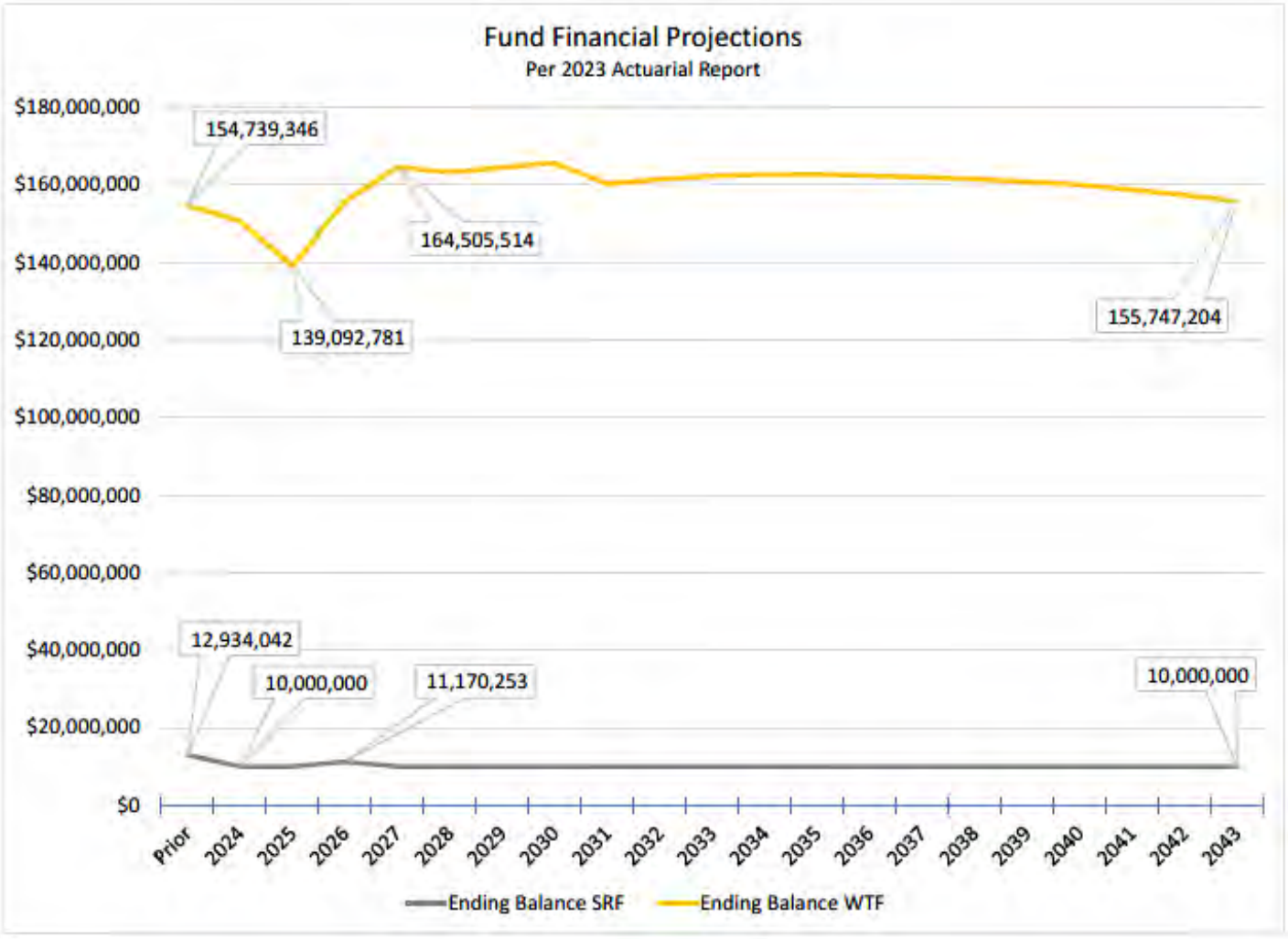


Figure 3

Recommendations from 2023 Actuary Report

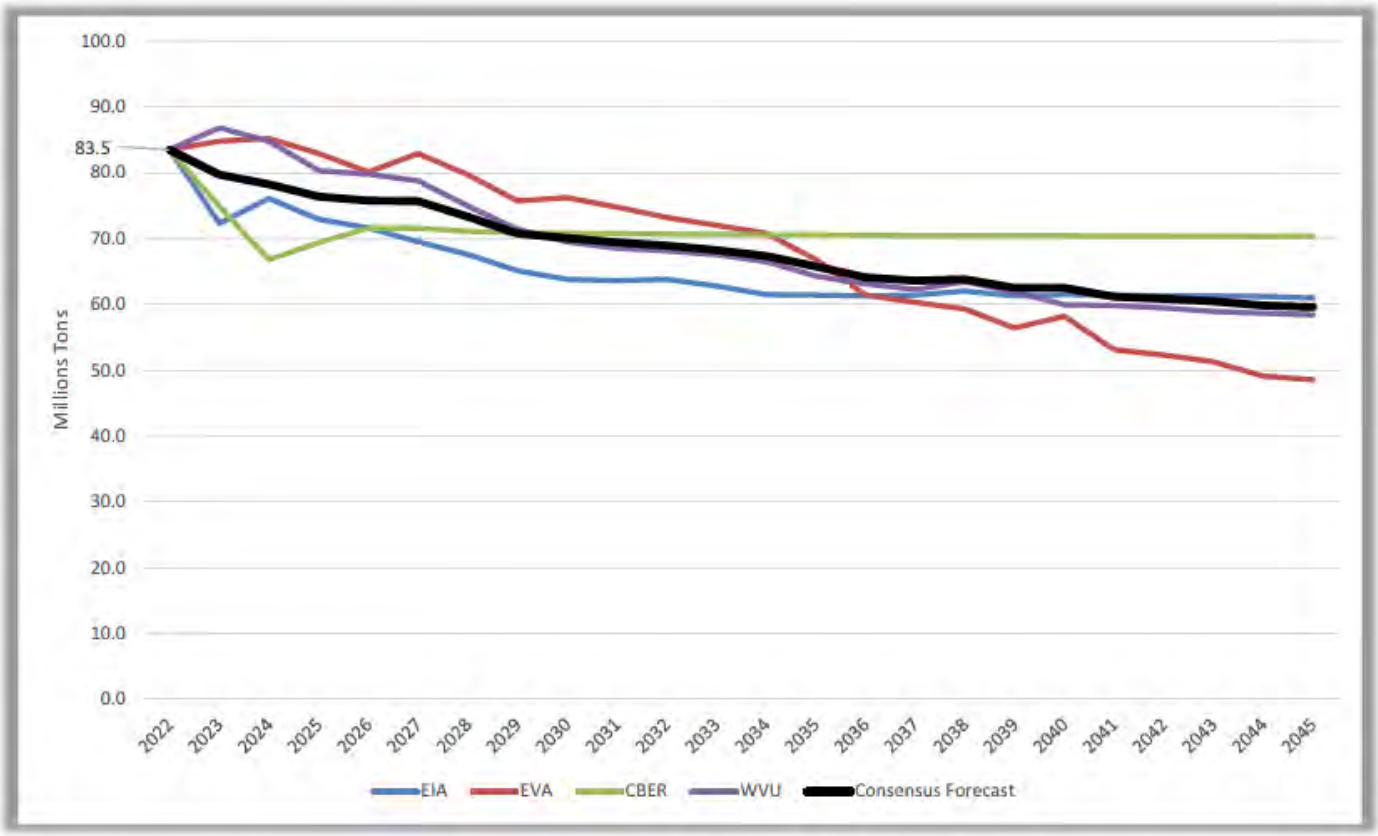
Coal Production Risks: There has been some instability in coal production forecasts and the coal market in general over the preceding decade because of different regulatory regimes, alternative energy adoption rates, economic events, and, most recently, the COVID-19 pandemic. Future studies may benefit from considering alternative coal production scenarios.

Permit Status History: Permit databases were evaluated as of a specific date. However, because this study estimates anticipated changes in permit status over time, it is necessary to make assumptions about permit statuses change in order to develop revocation models. If records exist, it could be possible to produce more accurate models if a full history of each permit (including all status changes over time and dates when status changes occurred) were available.

Coal Consensus Forecast by Marshall University-Center for Business & Economic Research

Consensus Forecast: The four long-term forecasts produced by EIA, EVA, CBER and BBER are combined to create the 2023 Consensus Forecast for West Virginia Coal Production. For simplicity, a simple average was used to calculate the consensus forecast[4] (Figure 6). Coal production in West Virginia is projected to decline steadily from 83.5 million tons in 2022 to 59.6 million tons in 2045.

Figure 6: Consensus and Component Forecasts 2023 (million tons)



Source: EIA, EVA, CBER, WVU, and Marshall University Department of Mathematics.

Summary: The four component models incorporate a range of possible levels of West Virginia coal production over the next 22 years, with varying forecasts that illustrate the impact of primary supply and demand variables and uncertainty over the continuation of recent trends. The consensus reduces uncertainty by combining the forecasts into one aggregate projection. The consensus forecast predicts West Virginia will experience a gradual decline in coal production throughout the period, but at levels that are four to seven million tons per year higher than the 2021 Consensus Forecast.

SRFAC Recommendation

The SRFAC recommends that the present 12.9 cent per ton tax dedicated to the Fund remain in force and that the tax dedicated to the SRWTF remain at 15 cents per ton. It was previously established by the Council that the Fund would cover all costs for both land reclamation and water treatment through June 2018. Then starting in July 2018, the SRWTF would begin covering the cost for water treatment—both water capital costs and ongoing water treatment costs. Following reviews of the financial status and investment earnings of both funds it was the consensus of the Council, this year, to continue paying for all reclamation costs out of the Fund to allow the SRWTF to continue building assets while earning higher yields. It was also agreed that fund transfers from the SRWTF to the Fund would occur, as needed, to maintain a fund balance of $10,000,000.

FINANCES OF THE SPECIAL RECLAMATION FUND & THE SRWTF

This section of the Report to the Legislature outlines the financial status of the Fund and the SRWTF for calendar year 2023 and provides comments regarding the future financial position of both. The three key factors that have the most effect on the adequacy of the Funds is the coal production levels in West Virginia, the risk of future forfeitures, and the cost of reclaiming existing and future bond-forfeited sites.

The WVDEP acknowledges that future forfeitures and any water management costs associated with them could affect funding needs of the Fund and the SRWTF. WVDEP is currently working to compile water management and treatment costs on active (still permitted) sites to better inform the actuaries and policy makers in prediction of future water management and treatment costs associated with revoked sites. Additionally, the SRFAC is continuously looking for ways to improve upon the ability to project future forfeitures, which will continue to be a focal point of the SRFAC through 2023. The Office of Surface Mining Reclamation and Enforcement (OSMRE) supports WVDEP's efforts to improve the active mine pollutant inventory to ensure the

accuracy of future forfeiture cost projections and has formed a team with WVDEP to develop a work plan for obtaining additional data.

To summarize the data and analysis that follow, it should be noted that the Fund will continue to pay for all costs for both land reclamation and water treatment. Money transfers from the SRWTF to the Fund will occur as needed to maintain the Fund balance of $10,000,000.

As of December 31, 2023, the Fund has accumulated assets of $14.2 million, a 8.2% decrease from 2022 values, while the SRWTF has accumulated $159.8 million in assets, a 6.4% increase over 2022 SRWTF values. Increased revenues for the SRWTF are attributed to the tax increase in 2012 as well as the improved investment strategy which was initiated in 2013 as described below.

In May of 2013, following numerous discussions between WVDEP personnel and members of the Investment Management Board and the Board of Treasury Investments, the SRFAC was updated on various investment options and made the following recommendations:

The first recommendation was in two parts:

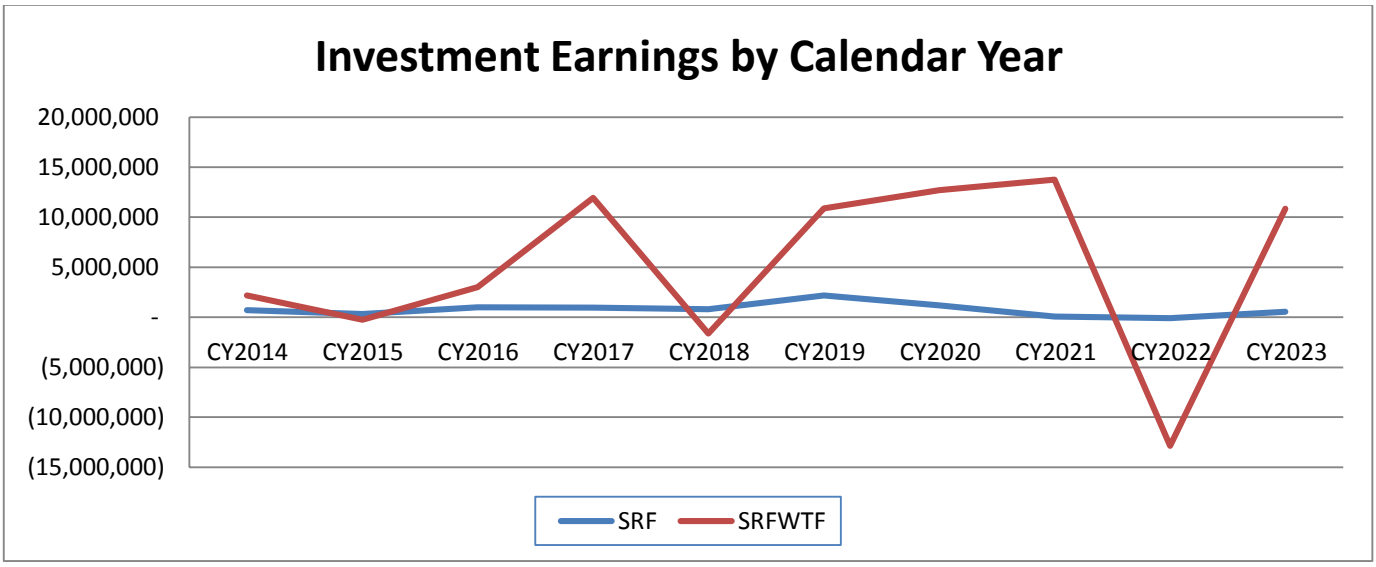
1. That the current balance of the Water Quality (WQ) Trust Fund and all additional revenue of the WQ Trust Fund through Fiscal Year 2018 be invested in the Investment Management Board (IMB) Fixed Income Pool until FY 2019.
2. That the WVDEP develops plans to maximize the return on investment for future WQ Trust revenue.

The second recommendation was also in two parts:

1. That the current balance of the Special Reclamation Fund be invested in the Board of Treasury Investments West Virginia Short Term Bond Pool except for $5 million, which should remain in the West Virginia Money Market Pool.
2. That the WVDEP develops plans to maximize the return on investment for future SR Fund revenue.

In October of 2013 the balance of $28 million from the SRWTF was transferred to the Investment Management Board Fixed Income Pool.

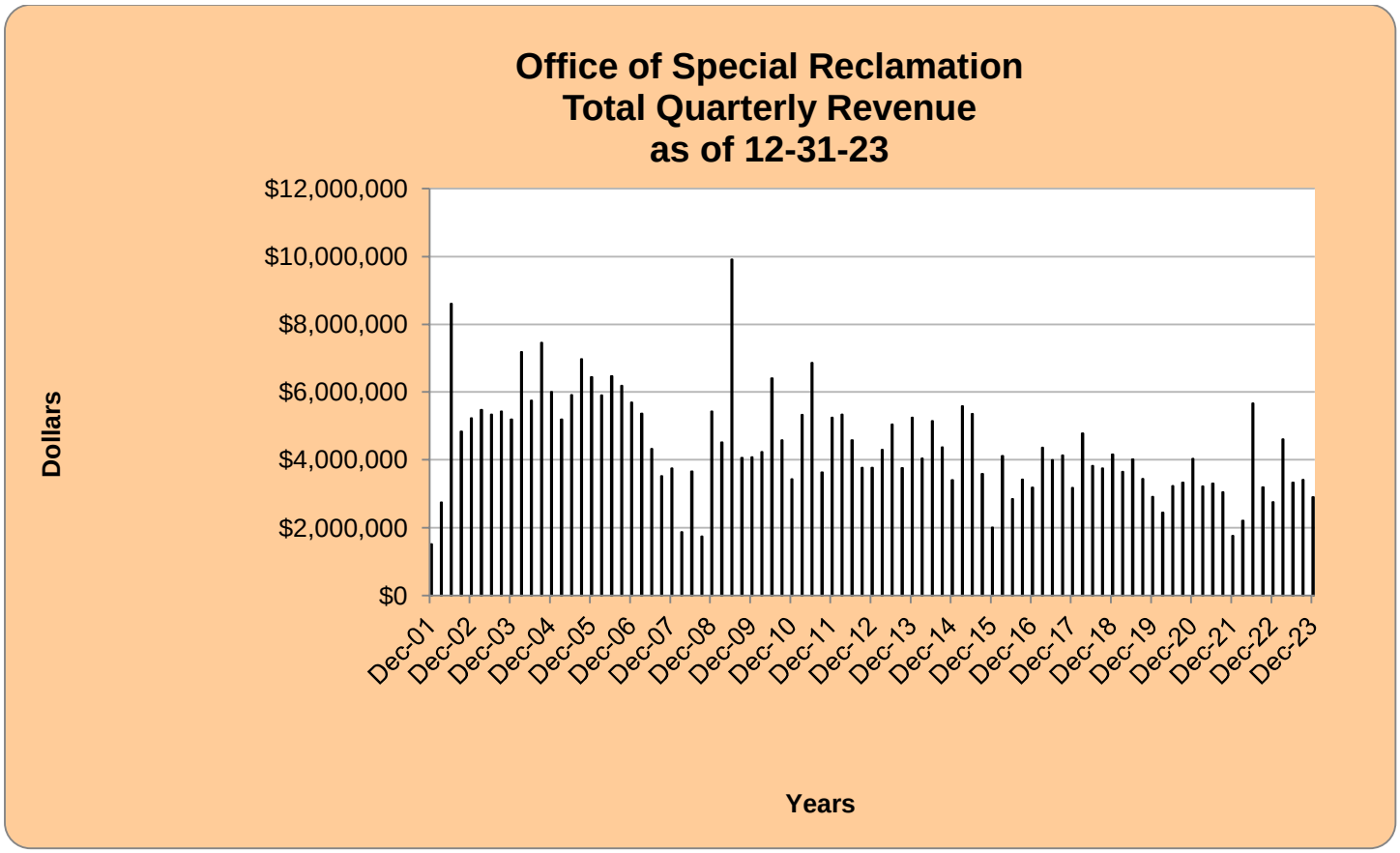
In June of 2013, except for $5 million, the balance of the Fund was transferred to the West Virginia Short Term Bond Pool. The following chart depicts the investment earnings for the previous six years prior to the new investment strategies and results of the new strategy leading up to the current year.



Since 2001, despite a very aggressive reclamation schedule, the Fund has been serving the people of West Virginia well through providing for the reclamation of bond-forfeited (permit revoked) sites. From post-1977 time until legislation in 2001, there were 392 revoked permits requiring reclamation, including 122 requiring water treatment. Since passage of that legislation, an additional 254 permits have been revoked as well, bringing the total to 646 revoked permits requiring reclamation. Reclamation work remains on 221 sites, which includes ongoing water remediation sites. Regarding water treatment, the Fund is treating water at 158 sites and has an additional 27 sites under review or construction. As of December 31, 2023, the Fund had accumulated cash and investments totaling $14.2 million, while the SRWTF had accumulated $159.8 million.

A complete inventory of all bond forfeiture sites is in Appendix E, along with bond forfeiture sites that have mine drainage related problems, and a prioritized order in which they will be addressed.

Graphic summaries of the status of the Funds are outlined in the following figures.


Office of Special Reclamation
Total Quarterly Revenue
as of 12-31-23
Dollars
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
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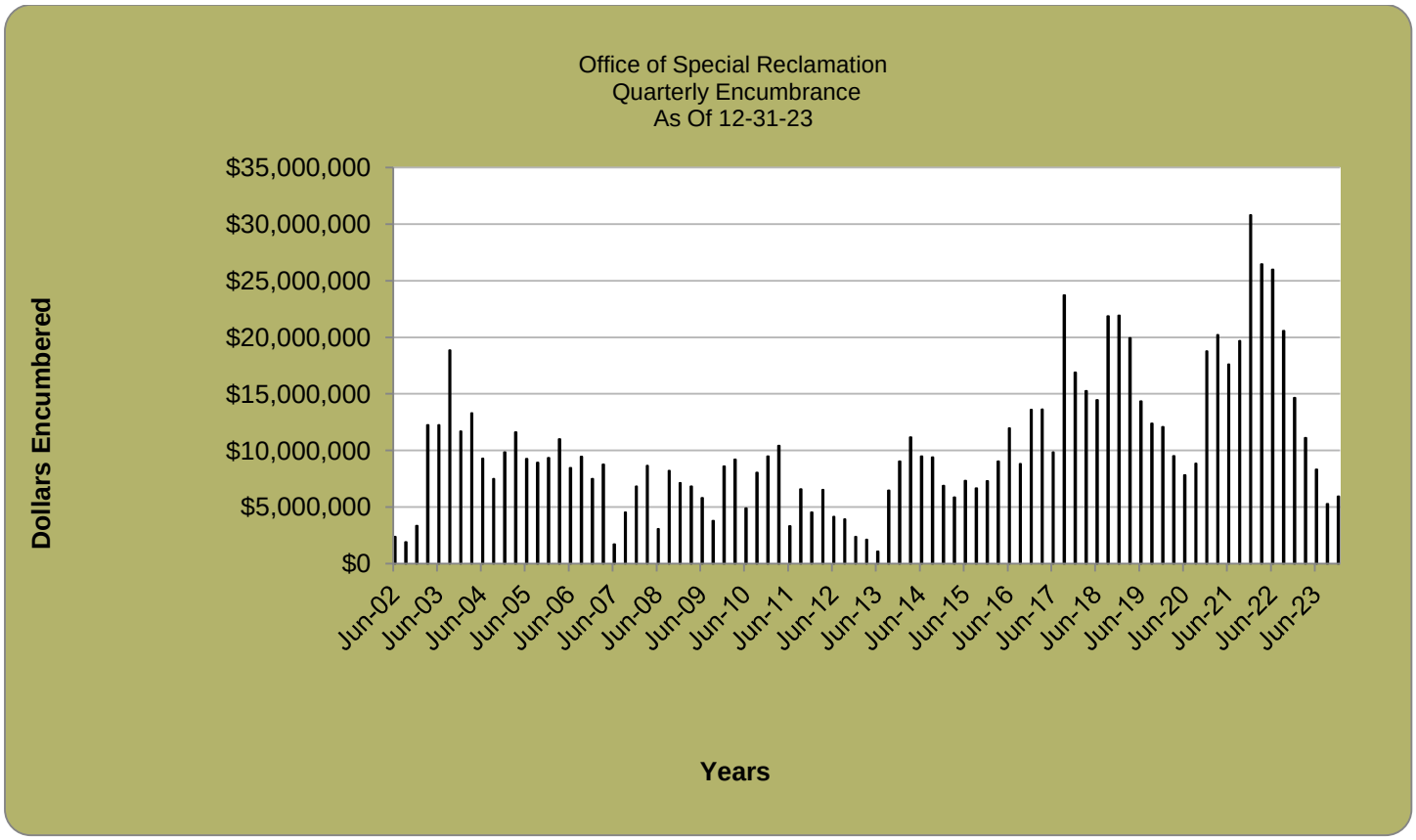
Years

Figure 3


Office of Special Reclamation
Quarterly Encumbrance
As Of 12-31-23
Dollars Encumbered
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Jun-02
Jun-03
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Years

Figure 4

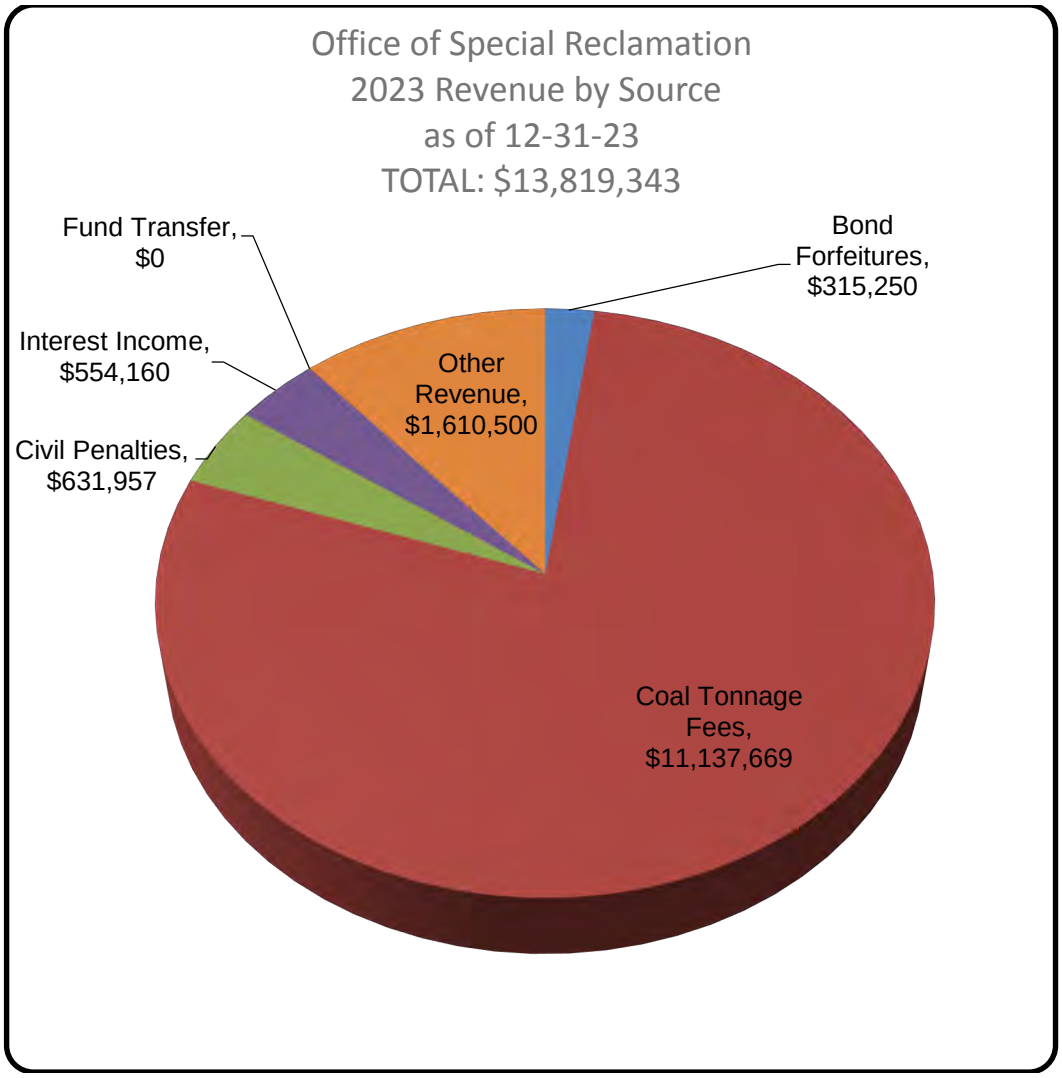


Figure 5

Water Treatment Funding

A complete inventory of bond forfeiture sites that are producing mine drainage that violate effluent limitations or applicable water quality standards for long-term treatment of these sites are in Appendix E.

The current main funding mechanism for bond-forfeited sites is the 27.9 cent tax per ton of clean coal mined, of which fifteen cents is dedicated to the SRWTF.

In 2008, the Legislature authorized, but did not separately fund, the SRWTF. In reliance on the SRWTF statutory authorization, beginning in July 2008, coal tax revenues based on a tax rate of 1.5 cents per ton were being paid into the SRWTF. In addition, coal tax revenues based on 12.9 cents per ton were being paid into the

Fund. In 2012 the Legislature increased the amount dedicated to the SRWTF to 15 cents per ton; but based on the funded status of the Fund at the time the Fund remained at 12.9 cents per ton.

The average yearly revenue, fees and investment earnings for the past five years have been $18.8 million per year. The current balance in the SRWTF is $159.8 million as of December 31, 2023. The SRFAC is continuing to look at alternatives for water treatment funding.

Increased water capital cost and water treatment cost are the result of two identical lawsuits filed against the WVDEP. In 2011 and 2012 the WVDEP entered separate consent decrees with the northern and southern district courts respectively. As will be discussed later in this report, the WVDEP was required to apply for and obtain NPDES permits for all the sites included in Attachment A of the consent decrees plus an additional 21 sites which were included in an earlier lawsuit, for a total of 192 sites. The WVDEP estimated that it would cost approximately $35.5 million to bring bond forfeiture sites into compliance with the more stringent water quality-based effluent limits. Additionally, WVDEP estimated that it would cost approximately $6.7 million to operate and maintain these treatment systems on an annual basis.

WVDEP has fulfilled the requirements of the Consent Decree by obtaining all NPDES permits.

Additional Charges to the Fund Due to NPDES Requirements

Due to NPDES requirements in 2012, the WVDEP has been faced with charging more expenditures to the Fund. These include:

- Realty – Land and/or easement purchases have been necessary to expand existing or new water treatment sites outside permit boundaries. Surveying and appraisal costs are included in these purchases.

  Increased staff – As a result of having to apply for and obtain NPDES permits at all bond forfeiture sites now and into the future, the WVDEP has found it necessary to incorporate an NPDES permitting section into the Office of Special Reclamation (OSR - The office responsible for reclamation of land and waters for bond forfeited sites). Five new staff members consisting of one (1) Program Manager and four (4) field staff personnel have been added to fulfil the NPDES requirements for the WVDEP. Additionally, to reduce surveying costs associated with realty needs and design, a licensed surveyor was hired.

Also, two (2) land agents were hired in 2018 to address realty needs, although the responsibilities and salaries are split between OSR and the Office of Abandoned Mine Lands.

- NPDES permitting fees:
    - Application fees - $1,000/application
    - Modification fees - $2000/Major.mod. and $1000/minor
    - Annual fees - $2000/permit.
    - Reissuance fees - $ 3000/permit
- Additional water sampling related to permit applications.
- The WVDEP entered into a grant agreement with the West Virginia Land Stewardship Corporation (WVLSC) to provide contractual services in the areas of design, construction, and project oversight. The purpose of the agreement was to enhance the capacity of WVDEP professional staff to meet reclamation deadlines. It is estimated that project costs increase by 10 to 15% for contractual services and another 1% for indirect cost associated with managing the grant.

  The WVLSC was created by state legislation in 2013 to lessen the burdens of government when government identifies a need for WVLSC to assist with land stewardship and the remediation of properties with known environmental issues, including former mining sites.

  A pilot grant agreement, known as the LaRosa Fuels site (Permit Number S-1051-86), was approved in 2016 to evaluate the efficiency and benefits of a work-sharing partnership.

  WVDEP approved a grant amendment in 2017 and provided additional funds, as well as additional permits to be reclaimed. The grant was structured as an up-front payment to provide the WVLSC with the funds needed to cover the level of liability inherent in multiple reclamation projects, which requires engaging multiple engineering and construction firms simultaneously. Having the resources to cover at least the original liability estimates provided by WVDEP gave the WVLSC Board the level of certainty it needed to take on the project.

  The WVLSC invested the grant funds so that they could earn interest that could be used on the project. In 2018, when it was identified that WVDEP investments were gaining a higher rate of return, the grant funds were returned to the WVDEP to maximize investment earnings. The WVLSC invoices the WVDEP when expenditure regularly occurs. WVLSC had one design

project in 2021 to fulfill the grant agreement, which was completed before the end of the year, and the agreement was terminated.

WVDEP Policy Relevant to the Fund

Effective May 21, 2014, the WVDEP has implemented a new policy establishing a standard procedure the WVDEP will follow to terminate the State's jurisdiction over bond-forfeited former mining sites (Special Reclamation Sites). With a decision that the Special Reclamation Site has satisfied the applicable performance standards, WVDEP will terminate jurisdiction over the subject Special Reclamation Site. The policy limits the vulnerability of the State, and consequently the Fund, by reducing the possibility of lawsuits pertaining to damages unrelated to former mining practices or reclamation practices, i.e., due to recreation, timbering, oil & gas, etc., as well as any changes to environmental laws taking effect after reclamation of the subject Special Reclamation Site. The WVDEP will retain jurisdiction of Special Reclamation Sites, or portions thereof, that are necessary for the effective treatment of mine discharges emanating from the subject Site. At the end of 2023, the WVDEP has terminated jurisdiction on 34 sites.

Litigation

1. The Fund through FY 2018 and the SRWTF starting in FY 2019 has acquired liability for additional water treatment because of lawsuits filed against the WVDEP, as described below.

Identical complaints were filed in the Northern and Southern District Courts, Civil Actions No. 07-cv-87 (the "Northern District Case") and No. 2:07-0410 (the "Southern District Case"), assigned to Judge Irene Keeley and Judge John T. Copenhaver, Jr., respectively. Both cases were styled *West Virginia Highland Conservancy and West Virginia Rivers Coalition v. Randy C. Huffman, Secretary, West Virginia*

Department of Environmental Protection.

The two suits alleged that the West Virginia Department of Environmental Protection (WVDEP) had violated, and continues to violate, the federal Clean Water Act (the Act) by failing to obtain West Virginia National Pollutant Discharge Elimination System (WV/NPDES) permits when the WVDEP reclaims and treats water at bond forfeited sites as directed by state law. The Northern District Case named 18 specific bond forfeited sites and the Southern District Case named 3 sites.

On March 26, 2009, the Northern District Court entered summary judgment in favor of Plaintiffs in the Northern District Case and granted a permanent injunction. The injunction requires WVDEP to apply for, process, and issue WV/NPDES permits to itself for the discharge into waters and streams of pollutants from the eighteen bond-forfeited, coal mining sites at issue in the case, whose reclamation the agency is required to manage. WVDEP appealed this decision to the United States Court of Appeals for the Fourth Circuit ("Fourth Circuit Court of Appeals"). By order dated November 8, 2010, the Fourth Circuit Court of Appeals affirmed the Northern District Court's ruling.

Similarly, a motion for summary judgment in the Southern District Case was granted by Order dated August 24, 2009. The Southern District Court found that the Secretary of the WVDEP was "in violation of the National Pollutant Discharge Elimination System permitting requirements of the Clean Water Act." The Southern District Court ordered the Secretary to "apply for, and obtain, NPDES permits for all sites at issue in this action," and the parties subsequently submitted a joint stipulation agreeing to the same injunctive relief and timeframes for compliance set forth in the Northern District litigation. The Southern District Court entered final judgment on August 31, 2010.

On January 11, 2010, the same Plaintiffs (West Virginia Highlands Conservancy and West Virginia Rivers Coalition) and the Sierra Club submitted a letter giving WVDEP notice of their intent to sue WVDEP regarding discharges from 131 additional bond forfeited sites on the same legal basis as the previous suits. Based on the outcome of the previous litigation, WVDEP engaged in settlement negotiations with the Plaintiffs and reached agreement regarding the permitting of the 21 sites in the previous litigation and the additional 131 sites. In August 2011, the Plaintiffs filed two new suits regarding the additional sites, *West Virginia Rivers Coalition, et al v. Huffman*, Civil Action No. 1:11-cv-118 (N.D. W.Va.), and *West Virginia Rivers Coalition, et al v. Huffman*, Civil Action No. 2:11-cv-524 (S.D. W.Va.) and lodged a proposed Consent Decree with both courts. The Northern District Court entered the Consent Decree on October 12, 2011. The Southern District Court entered the Consent Decree February 10, 2012. A list of all bonds forfeited sites at issue in all four suits is attached to the Consent Decree as Attachment A. As required by the Consent Decree on July 2, 2012, WVDEP submitted a Final Treatment Cost Report to Plaintiffs and SRFAC, in which WVDEP determined the capital cost and annual operating and maintenance costs for water discharges from each bond forfeiture site to meet applicable water quality-based effluent limitations. The WVDEP estimated that these costs will amount to $35.5 million for one-time capital construction costs and over $6 million in annual operations and maintenance costs.

The Consent Decree resolves all four suits filed by the Plaintiffs regarding bond forfeited sites. The Consent Decree required WVDEP to obtain WV/NPDES permits for all 21 bond forfeiture sites cited in the initial litigation by September 1, 2011. Thereafter, WVDEP issued draft WV/NPDES permits for 50 additional sites by the end of each calendar year, beginning in 2012. By December 31, 2015, the Consent Decree required WVDEP to issue draft WV/NPDES permits for all bond forfeited sites listed in Attachment A of the Consent Decree and for sites that were in existence on the date the Decree was executed. Thereafter, the WVDEP shall exercise its best judgment on the timing of issuance of draft permits for sites forfeited after the execution of the consent decree.

Note: *The final draft permit was issued December 10, 2015.*

2. A third case presents potential for future litigation, should the legislature not adequately fund the Fund and SRWTF. *West Virginia Highlands Conservancy v. Secretary Salazar, DOI,* Civil Action No. 2:00-1062 (S.D. W.Va.). The West Virginia Highlands Conservancy (WVHC) had filed a motion with the U.S. District Court for the Southern District of West Virginia to reopen the case and schedule further proceedings on the grounds that the recommendations of the SRFAC were not being followed with regard to funding the Special Reclamation Fund. Based upon the Legislature's extension of funding through the Continuing and Temporary taxes, the case was placed on the court's inactive docket as of May 2008; however, the court allowed the possibility of a renewed motion if the Legislature does not continue to provide sufficient monies for the Fund to remain solvent.

In March 2011, the WVHC moved once again to have the litigation reopened alleging continuing problems with the Fund. A status conference was held on August 5, and the court ordered the filing of a joint status report. On August 25, 2011, the WVHC and the Defendants filed a joint status report with the court. The WVHC stated that the court should not delay reopening the case until the new actuarial report and SRFAC recommendations are issued, whereas the Defendants recommended that it was premature for the court to reopen this matter prior to the close of the 2012 legislative session.

On March 30, 2012, a status conference call was conducted by the Court. In light of the enactment of Senate Bill 579 that increased the special reclamation tax from 14.4 cents to 27.9 cents per ton of clean coal mined, the Plaintiff acknowledged that it would move to withdraw its Second Motion to reopen and refile it to address the changed circumstances that have occurred since the filing of its motion to reopen.

On April 2, 2012, the WVHC filed its Motion to withdraw its Second Motion to reopen this case with the Court. On August 5, 2012, the Court issued an Order granting the Plaintiff's Motion to withdraw its Second Motion. In addition, the Court granted the WVHC leave to file an additional motion to explain deficiencies that remain, notwithstanding the recent revenue increase in the Special Reclamation Fund.

This case remains open, so the District Court can address any issue that may arise regarding the State's ABS (alternative bonding system).

3. On or about April 20, 2016, the West Virginia Highlands Conservancy, West Virginia Rivers Coalition, and Sierra Club sued the West Virginia Department of Environmental Protection's (WVDEP) Special Reclamation Program alleging it was in violation of seven West Virginia National Pollution Discharge Elimination System (WVNPDES) permits issued for sites controlled by the Special Reclamation Program, four in the United States District Court for the Northern District of West Virginia[1] and three in the Southern District[2]. The lawsuits allege that the WVDEP had discharged and continued to discharge quantities of aluminum, iron, nitrogen, ammonia, and suspended solids in excess of the effluent limitations in those permits. The lawsuits further allege discharges of effluent with pH outside of the permit range. On December 12, 2016, the parties met at WVDEP's headquarters in Charleston. The WVDEP explained to the Plaintiffs that a timetable for achieving compliance had already been established and were included in a corrective action plan required under the enforcement actions being carried out by the WVDEP's Division of Mining and Reclamation. On July 10, 2017, the parties filed a consent decree in the Northern District action. On April 25, 2018, the parties filed a consent decree in the Southern District. The compliance requirements found in these consent decrees are based on the schedule that the WVDEP had prepared for inclusion in the corrective action plan; no new or different requirements were added as a result of the litigation.

4. On June 29, 2021, Appalachian Mountain Advocates, on behalf of Sierra Club, West Virginia Highlands Conservancy, and West Virginia Rivers Coalition, delivered to the West Virginia Department of Environmental Protection ("WVDEP") a Notice of Intent ("NOI") to sue for violations of the Clean Water Act regarding WV/NPDES Permit No. WV1027301, which is associated with the Greendale bond forfeiture site operated by the WVDEP Office of Special Reclamation. Discussions between the parties have resulted in no further legal action being taken by either party to date.

5. *Living Lands, LLC and D.C. Chapman Ventures, Inc. v. Jack Cline, Brady Cline Coal Co., Spruce Run Coal Co., Harold Ward, Secretary, West Virginia Department of Environmental Protection, Civil Action No.*

3.20-cv-00275, revolves around three primary claims. The first of which being that unlined treatment ponds, unlined AMD sludge drying pits for treated sludge, and unlined conveyance ditches allow for infiltration and pollution of groundwater; therefore, point sources requiring individual NPDES permits. The second being that the material in the treatment ponds and the treated sludge in the sludge drying pits are hazardous wastes and/or solid wastes under RCRA, therefore triggering the relevant waste handling and disposal requirements. The third being that the material in the unlined treatment ponds, unlined sludge drying pits, and unlined conveyance ditches is AMD contaminated mining waste under CERCLA, therefore triggering financial responsibility requirements for potential responsible parties, including but not limited to the DEP.

The implications of the DEP losing on the first issue would be that similarly situated ponds across the state of West Virginia could be required to install liners and obtain NPDES permits, at a huge cost. A loss on the second issue would completely upend how the DEP, and all other entities who generate, store, or dispose of AMD sludge currently operate. A loss on the third issue would expose the DEP, as well as any other potential responsible parties in the handling history of the material, to massive financial liability for the cleanup and remediation of this site, and very likely many others. A loss on any of these claims is likely to impact similar operations in other states, as a precedent would allow for similar challenges in courts across the nation.

The case was set for trial in the United States District Court for the Southern District of West Virginia, before Judge Robert C. Chambers, on November 1, 2022. The Court has scheduled oral arguments on outstanding issues on January 30, 2023. Upon Motion made by WVDEP, Plaintiff's claims against WVDEP were dismissed in their entirety by the Court.

1. *West Virginia Highlands Conservancy, et al. v. Austin Caperton, Secretary, West Virginia Department of Environmental Protection,*
   United States District Court for the Northern District of West Virginia, Civil Action No. 1:16-cv-70
2. *West Virginia Highlands Conservancy, et al. v. Austin Caperton, Secretary, West Virginia Department of Environmental Protection,*
   United States District Court for the Southern District of West Virginia, Civil Action No. 2:16-cv-03769

2024 SRFAC Study Issues

- Continue to review the current investment strategy.
- Continue to improve upon the active mine pollutant inventory.
- Review coal refuse impoundment liabilities and review the required balance in the Water Trust Fund to support long term treatment obligations.
- Review Operations & Maintenance costs at active water treatment sites

The SRFAC is continuously looking for ways to improve the ability to project future forfeitures. Although limited in its current form, the DMR database of open permits is the primary source of information used for the biennial actuarial analysis of the SRF and SRWTF. The analysis also relies heavily on information obtained from forfeited permits and applied to current permits to project future forfeitures.

The SRFAC would like to explore options to increase the linkages of data from past forfeitures to open permits, to improve the predictive power of historical data. Some pieces of data that may be available in the permit databases that have not been previously utilized include:

- length of time a permit had a particular status
- number of times a permit changed status
- groupings with other permits (proximity or use), including Parent Company level of existing permits
- annual coal production associated with a permit or group of permits

The SRFAC recognizes that not all these pieces of data are available, even in open permits, and may no longer be available for permits that forfeited many years ago but would like to explore the ability to enhance the information available that can help quantify risk. The database will need to be cleaned and augmented prior to future in-depth study.

The SRFAC ***would like to recognize the WVDEP for their conscientious management of the Fund and the SRWTF and their efforts in minimizing the impacts of bankruptcies to the Funds.***

2023 SRF Advisory Council Annual Report

Special Reclamation Fund Advisory Council
Annual Report to the Legislature

Date: 2/8/24

Harold Ward, Secretary WVDEP
Ex Officio
Designee: Matthew Butler
WVDEP Deputy Director
Div. of Land Restoration
601 57th Street
Charleston, WV 25304

Riley Moore, Treasurer
Designee: Lindsay Marchio, Esq.
Deputy General Counsel
WV State Treasurer's Office
1900 Kanawha Blvd
Capital Complex Bldg. 1, Room E-145
Charleston, WV 25305

Paul Ziemkiewicz, PhD, Director
National Mine Land Reclamation Center
WVU – NRCCE Building
P.O. Box 6064
Morgantown, WV 26506

Chris Pence
10 Hale Street 4th Floor
Charleston, WV 25301

Jason Bostic, Vice President
West Virginia Coal Association
Northgate Business Park
P.O. Box 3923
Charleston, WV 25339

Ronald Pauley
50 Sunset Drive
Sumerco, WV 25567

Christine M. Risch
Director of Resource & Energy Economics
Marshall University
Center for Business & Economic Research
One John Marshall Drive
Huntington, WV 25755-0003

environmental advocate- vacant

Appendices for 2023 SRFAC Annual Report
(All Appendices as of 12-31-23)

A. WVDEP Graphs:

Land Projects to Be Contracted
Land Liabilities to Be Contracted
Reclamation Projects Started Since 6-30-01
Permits Revoked Since 6-30-01
Contract Dollars Encumbered Quarterly
Ending Cash Balance
Total Revenue
Revenue Collected by Source: Bonds, Civil Penalties, Tax

B. Rare Earth Elements

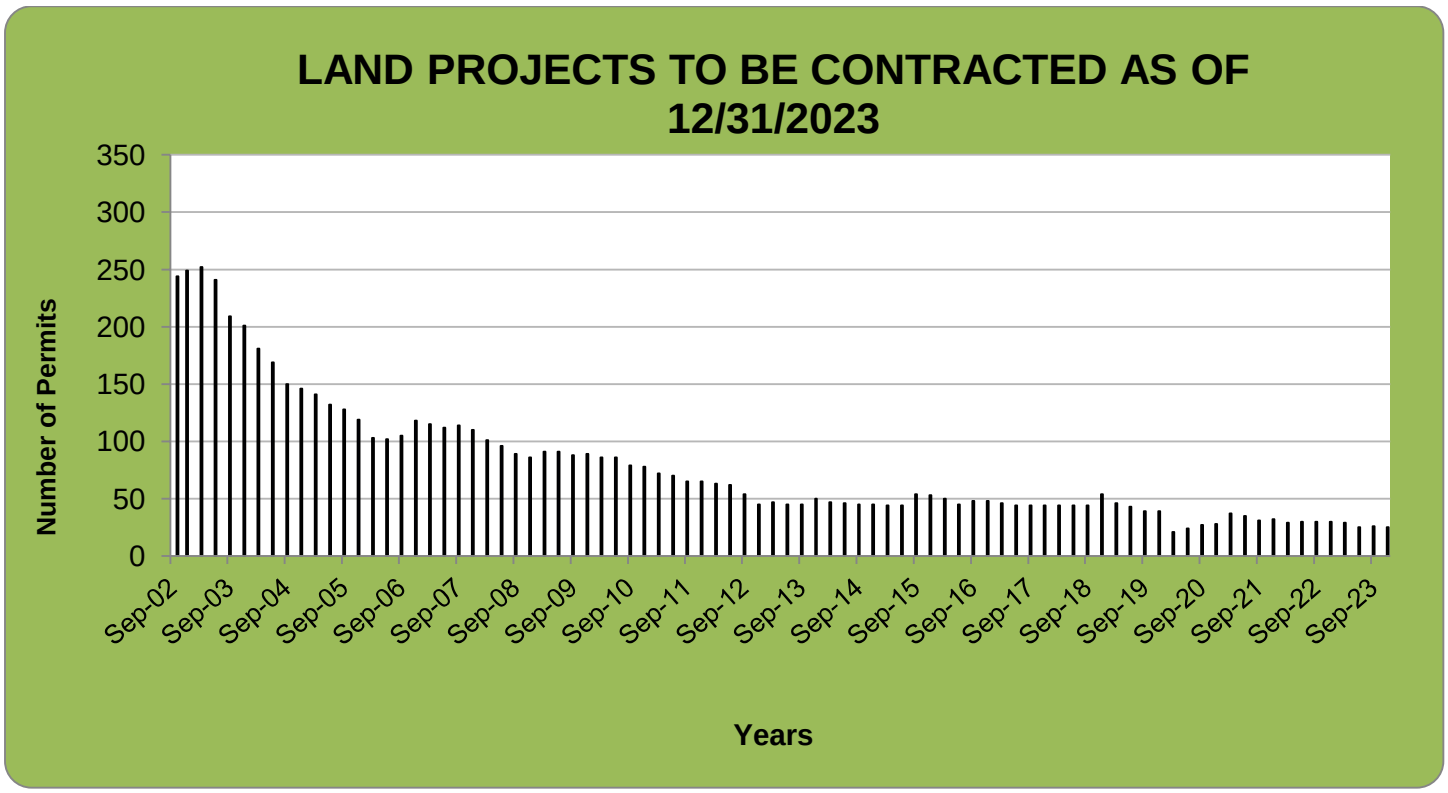
C. Coal Consensus Forecast

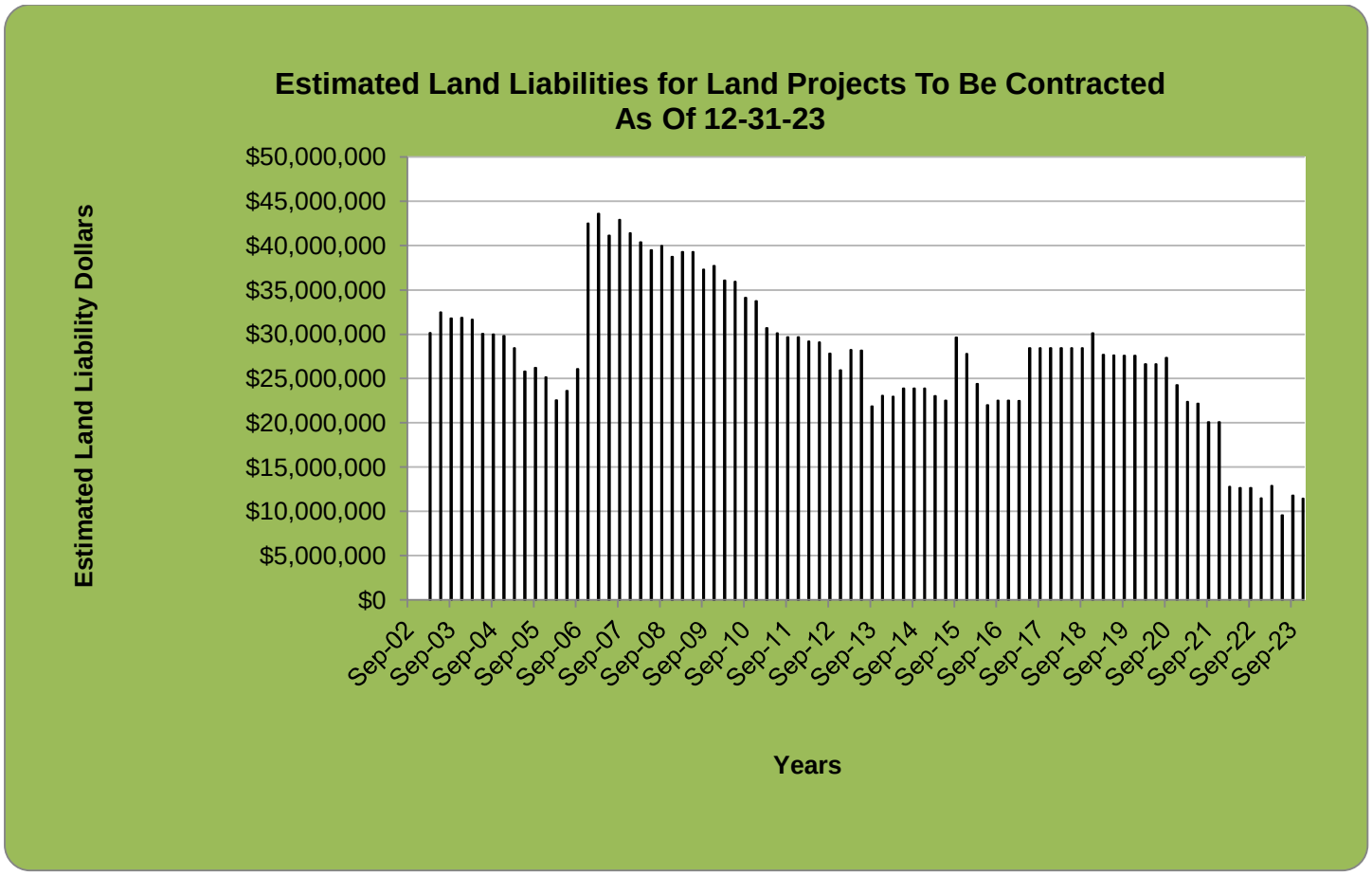
D. Actuarial Study

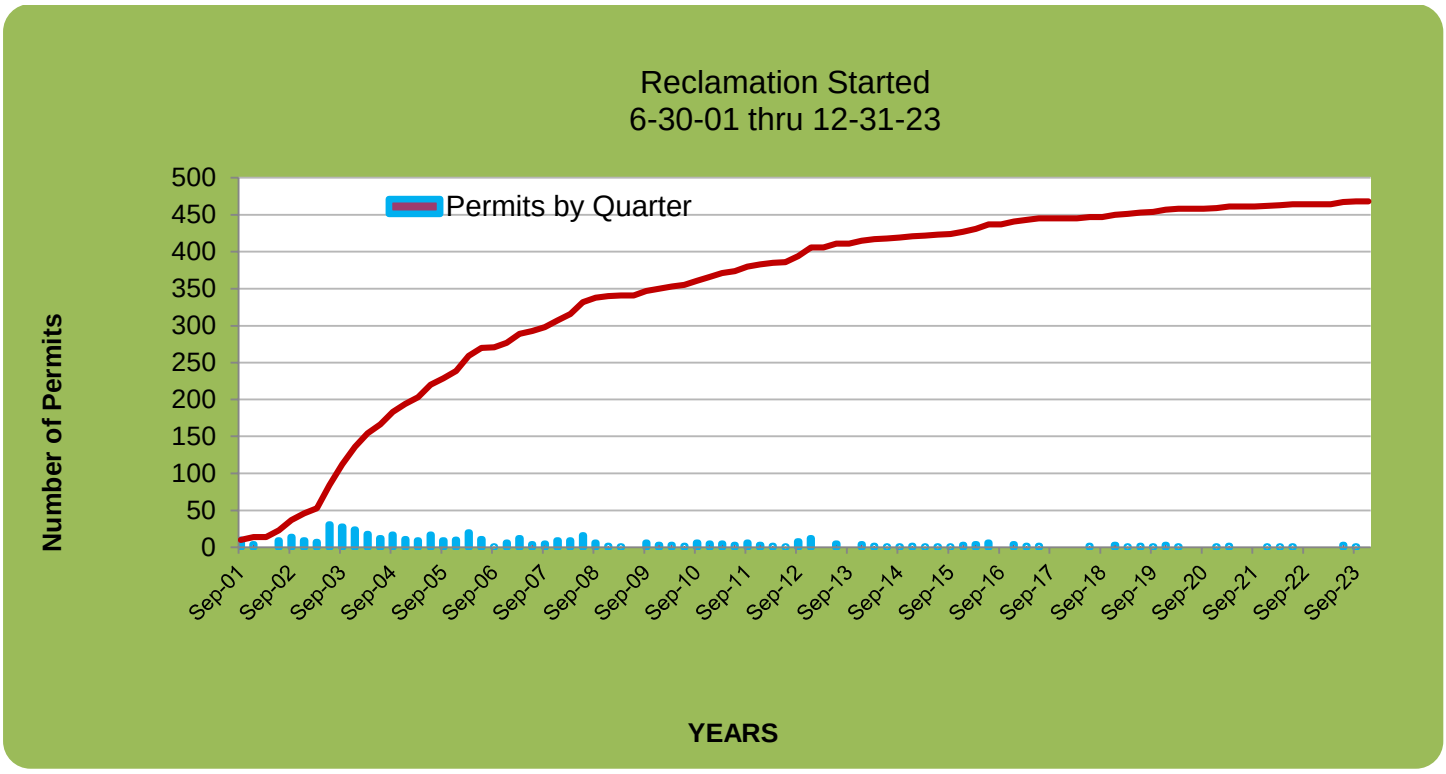
E. Bond Forfeiture Inventories

- **a. Revoked Permit Inventory**
- **b. Acid Mine Drainage Inventory**
- **c. Mine Drainage Treatment Prioritization**

Appendix A


LAND PROJECTS TO BE CONTRACTED AS OF 12/31/2023
Number of Permits
350
300
250
200
150
100
50
0
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Sep-14
Sep-15
Sep-16
Sep-17
Sep-18
Sep-19
Sep-20
Sep-21
Sep-22
Sep-23
Years


Estimated Land Liabilities for Land Projects To Be Contracted
As Of 12-31-23
Estimated Land Liability Dollars
$50,000,000
$45,000,000
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Sep-14
Sep-15
Sep-16
Sep-17
Sep-18
Sep-19
Sep-20
Sep-21
Sep-22
Sep-23
Years


Reclamation Started
6-30-01 thru 12-31-23
Permits by Quarter
Number of Permits
500
450
400
350
300
250
200
150
100
50
0
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
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Sep-18
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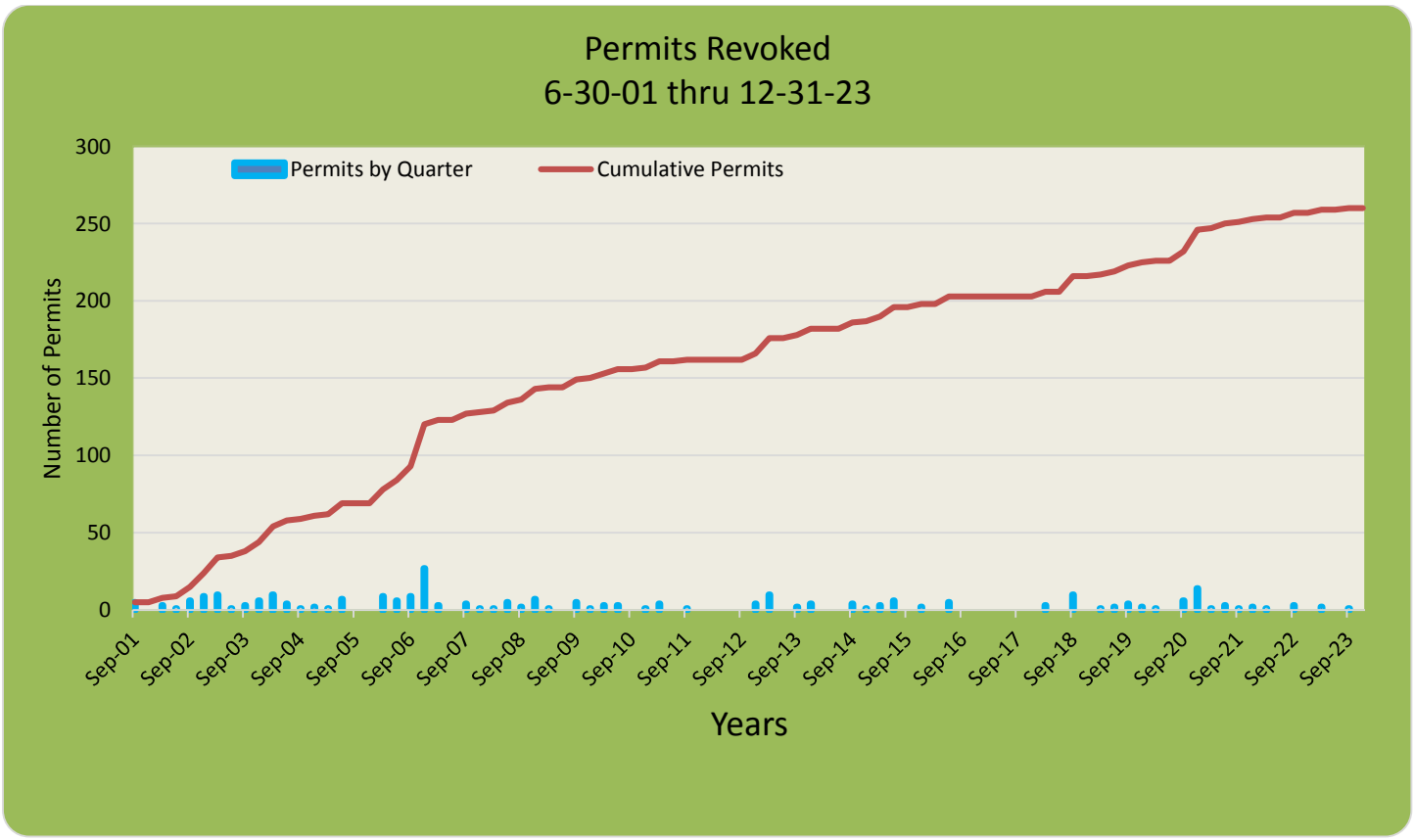
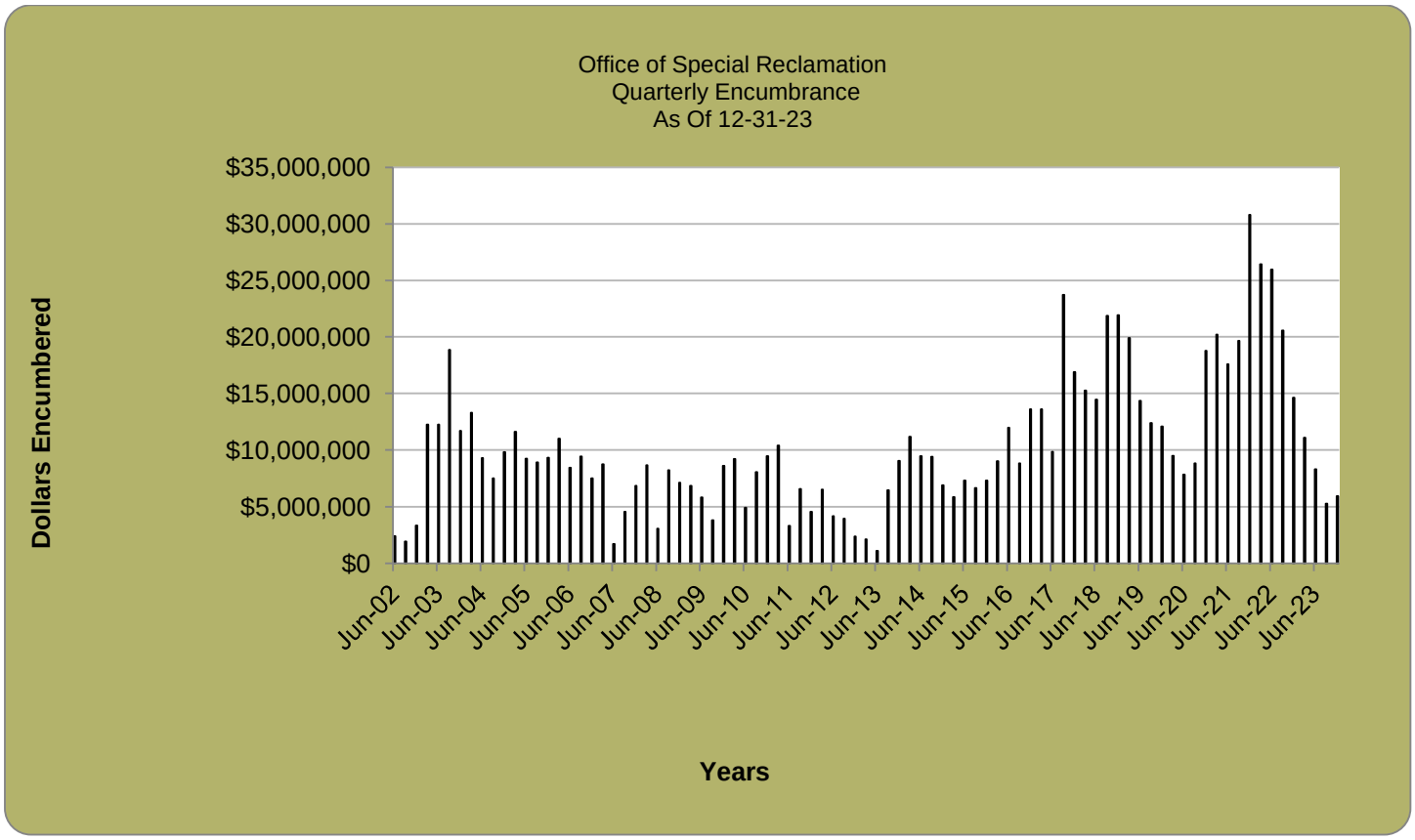
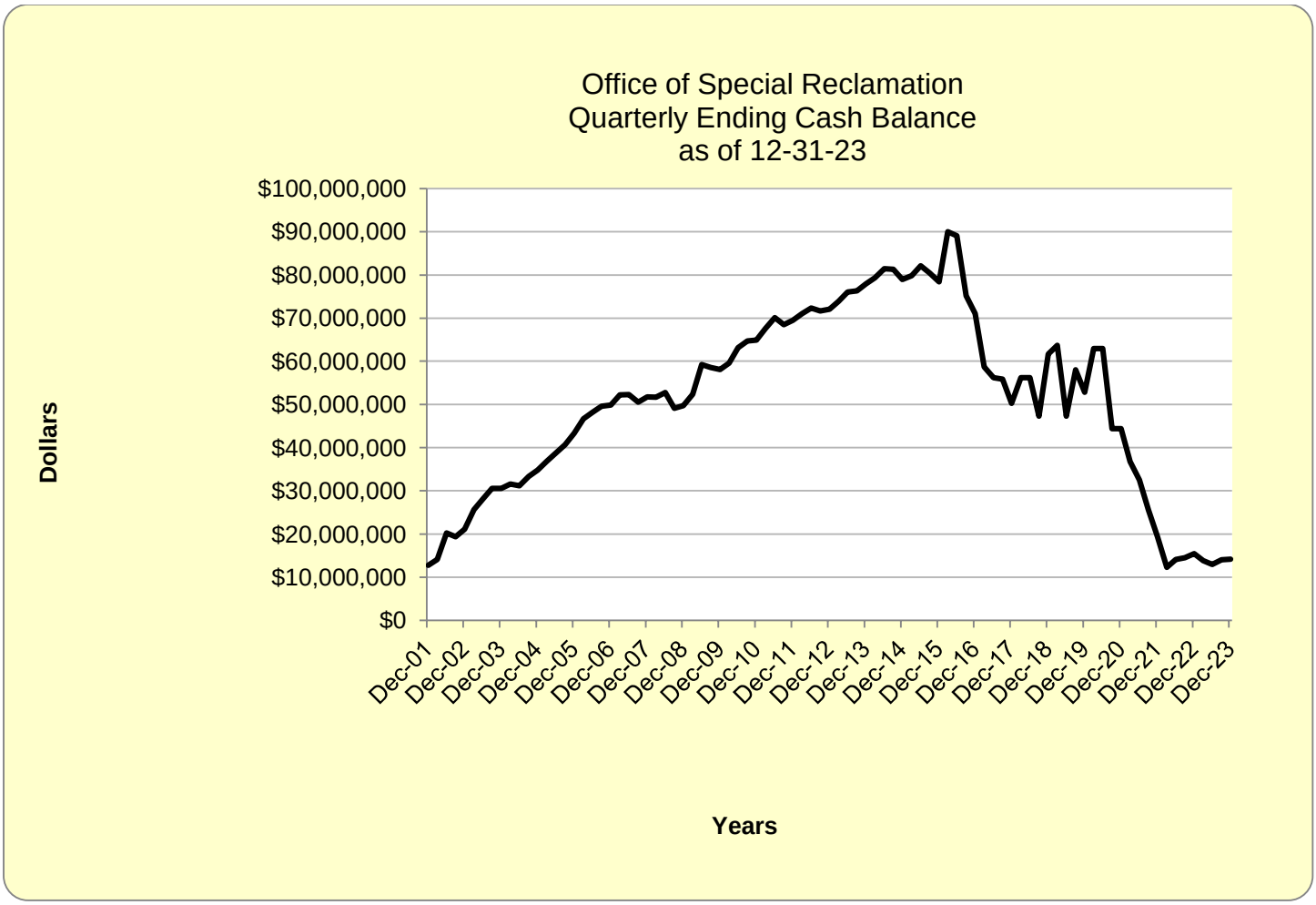
Sep-20
Sep-21
Sep-22
Sep-23
YEARS


Permits Revoked
6-30-01 thru 12-31-23
Permits by Quarter
Cumulative Permits
Number of Permits
300
250
200
150
100
50
0
Sep-01
Sep-02
Sep-03
Sep-04
Sep-05
Sep-06
Sep-07
Sep-08
Sep-09
Sep-10
Sep-11
Sep-12
Sep-13
Sep-14
Sep-15
Sep-16
Sep-17
Sep-18
Sep-19
Sep-20
Sep-21
Sep-22
Sep-23
Years


Office of Special Reclamation
Quarterly Encumbrance
As Of 12-31-23
Dollars Encumbered
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$0
Jun-02
Jun-03
Jun-04
Jun-05
Jun-06
Jun-07
Jun-08
Jun-09
Jun-10
Jun-11
Jun-12
Jun-13
Jun-14
Jun-15
Jun-16
Jun-17
Jun-18
Jun-19
Jun-20
Jun-21
Jun-22
Jun-23
Years


Office of Special Reclamation
Quarterly Ending Cash Balance
as of 12-31-23
Dollars
$100,000,000
$90,000,000
$80,000,000
$70,000,000
$60,000,000
$50,000,000
$40,000,000
$30,000,000
$20,000,000
$10,000,000
$0
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
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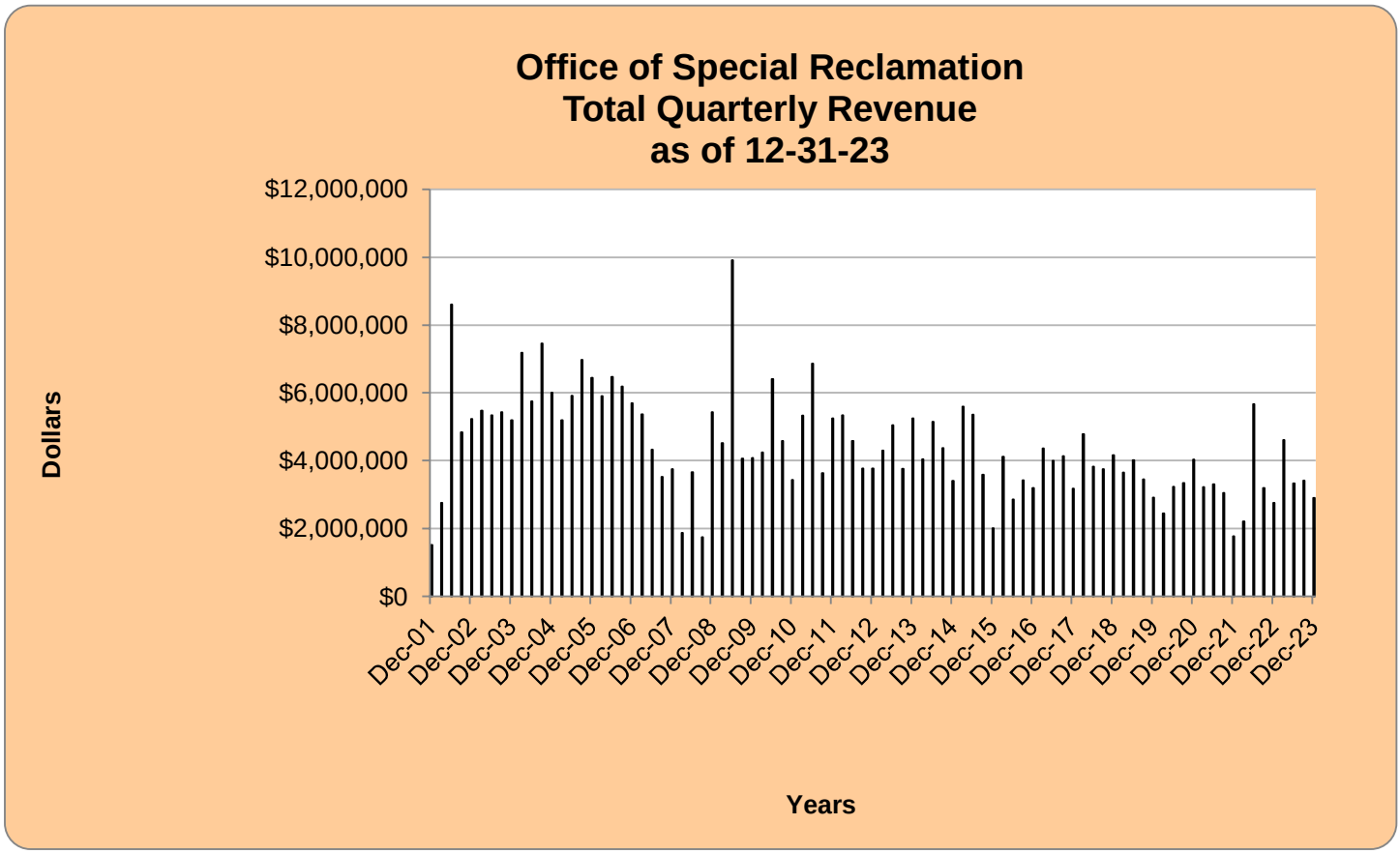
Dec-18
Dec-19
Dec-20
Dec-21
Dec-22
Dec-23
Years


Office of Special Reclamation
Total Quarterly Revenue
as of 12-31-23
Dollars
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Dec-13
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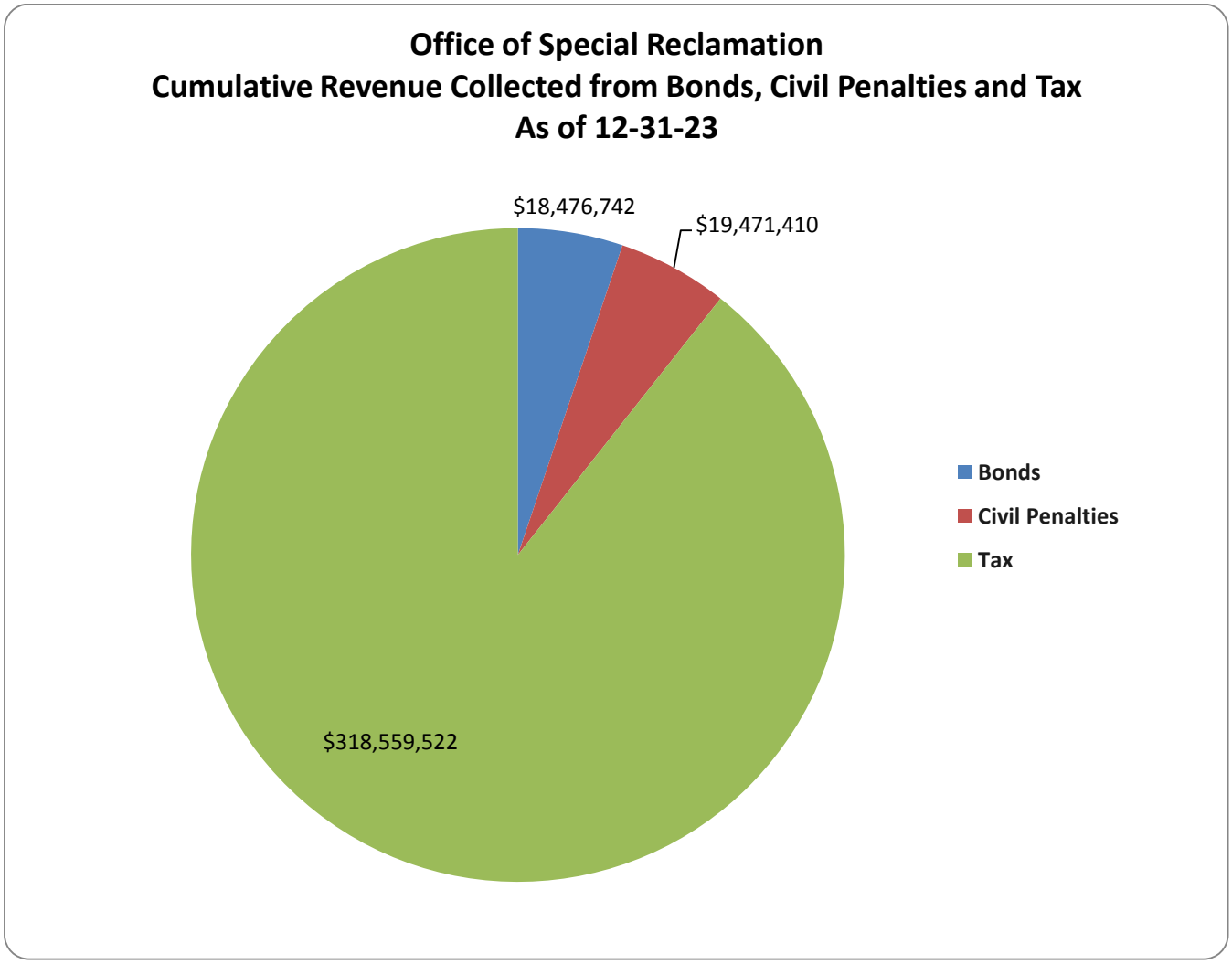
Dec-18
Dec-19
Dec-20
Dec-21
Dec-22
Dec-23
Years


Office of Special Reclamation
Cumulative Revenue Collected from Bonds, Civil Penalties and Tax
As of 12-31-23
$18,476,742
$19,471,410
$318,559,522
Bonds
Civil Penalties
Tax

Appendix B

Project Summary

Applicant: West Virginia University
Principle Investigator: Paul F. Ziemkiewicz, PhD
Project Title: At-source Recovery of Rare Earth and Critical Minerals from Acid Coal Mine Drainage ETD67
Project Objective: Develop and test a continuous process for efficiently producing an enriched rare earth element/critical mineral (RECM) concentrate from acid mine drainage (AMD) at the site of production, upstream of conventional AMD treatment.

- Sub-objective 1. Evaluate a process for purifying that concentrate at a central acid leaching/solvent extraction (ALSX) facility.
- Sub-objective 2. Achieve a target RECM oxide purity in excess of 90%.
- Sub-objective 3. Demonstrate that the final process will achieve its purity goal at commercially attractive efficiencies.

Project Description: RECM can be extracted from many waste products and ores. However, few such sources are economically attractive. We have identified that AMD is an attractive source since it relies on natural processes to create a concentrated, easily extracted source of RECM (REE+Co). Further, we have demonstrated that this process is environmentally beneficial since it would incentivize treatment of AMD and produces insignificant NORM or other noxious wastes.

Across the northern and central Appalachian Coal Basins, water pollution caused by acid mine drainage (AMD) is the single greatest cause of stream impairment. Our recent research has shown that AMD is enriched in rare earth elements (REE) and the critical mineral cobalt. AMD has an average total REE concentration of about 287 µg/L (0.287 ppm), ranging from negligible to 2,000 µg/L. Five of those REEs are classified as CM: Y, Nd, Eu, Tb, Dy while the critical mineral cobalt (Co) alone is present at about 75% of the TREE concentration in a given sample. Operators of AMD producing coal mines and tailings facilities are obliged to treat AMD to neutralize acidity and remove regulated metals (e.g., iron (Fe), aluminum (Al), and manganese (Mn)) prior to discharge. These metals precipitate as hydroxides during AMD treatment, leaving a solid residue that contains the RECMs.

We have created a concentrate of 80% REE derived from AMD treatment precipitates (DE FE 0026927). Ongoing research (DE FE 0031524) indicates that significant gains in efficiency can be made by semi-selective precipitation of RECM upstream of compliance AMD treatment when most of the gangue metals are still in solution. The strategy of using raw AMD as the feedstock to our acid leaching/solvent extraction (ALSX) refining process was recently demonstrated at the bench scale and also in the field where a mobile field unit was deployed at a conventional AMD treatment plant operated by WVDEP. Early work has produced solid feedstock with RECM ranging from 3.6% in the laboratory to 0.2% in an initial, continuous, field extraction trial. Of that amount, 0.14% are mixed REE oxides (MREO), including the five REEs that are also CM (0.07%) and the Critical Mineral cobalt (0.06%).

By focusing on raw AMD The proposed strategy 1) creates an enriched, homogenized REE feedstock, 2) reduces transportation costs to a REE refinery, 3) reduces acid consumption in the acid leaching step, and 4) reduces the volume of waste produced during REE refining. All of these factors would significantly reduce the capital and operating costs of an RECM extraction enterprise. For example, we have already identified transportation, waste handling and acid consumption during the leaching stage as major opX cost centers. Cost reductions resulting from at-source production of a RECM concentrate are obvious. Perhaps as important, extraction of a concentrate prior to AMD treatment dramatically reduces the mass of unreacted lime, an artifact of conventional AMD treatment, in the solid phase that would consume acid during the ALSX stage.

Major Participants: Virginia Tech University-ALSX technical support, TEA. West Virginia Department of Environmental Protection-will collaborate by jointly constructing and operating a field scale coupled

AMD treatment/RECM extraction plant. Rockwell Automation, Inc., will provide system controls, sensors and automation. InnoH2O, Inc., will provide their proprietary treatment system for recycling raffinate during ALSX.

Appendix C

Consensus Coal Production Forecast for West Virginia: 2023

Prepared for:

Special Reclamation Fund Advisory Council,

West Virginia Department of Environmental Protection

Date:

June 2023

Consensus Coal Production Forecast for West Virginia: 2023

Christine Risch
Director of Resource and Energy Economics, Center for Business and Economic Research

Nicholas Smith
Research Associate, Center for Business and Economic Research

Avishek Mallick, PhD
Associate Professor of Statistics, Department of Mathematics

Marshall University
One John Marshall Dr.
Huntington, West Virginia 25701
Phone: (304) 696-5747

Disclaimer:

The contents of this report reflect the views of the authors who are responsible for the accuracy of the data presented herein. The views expressed in this report are those of the authors and do not reflect the official policy or position of Marshall University or its governing bodies. The use of trade names, if applicable, does not signify endorsement.

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Consensus Coal Production Forecast for West Virginia: 2023

Introduction

The West Virginia Consensus Coal Production Forecast is a combined production forecast comprised of four component forecasts. A consensus approach to forecasting seeks the wisdom of the crowd in producing an expectation for output from the coal industry. The Consensus Forecast is used to provide the best expectation of tax revenues to be collected for mandatory reclamation activities conducted through the Special Reclamation Fund and the Special Reclamation Water Trust Fund.

This report describes recent historical coal production trends for the State of West Virginia including the individual industries that comprise the major segments of demand for coal produced in West Virginia. Each of the component forecasts used to form the Consensus Forecast is described, with information about assumptions and resulting projected levels of production for West Virginia. The process used to produce the Consensus is also described, including the weightings applied to each of the component forecasts. The West Virginia Consensus Coal Production Forecast is calculated for the years 2023 through 2045.

Overview of West Virginia Coal Production

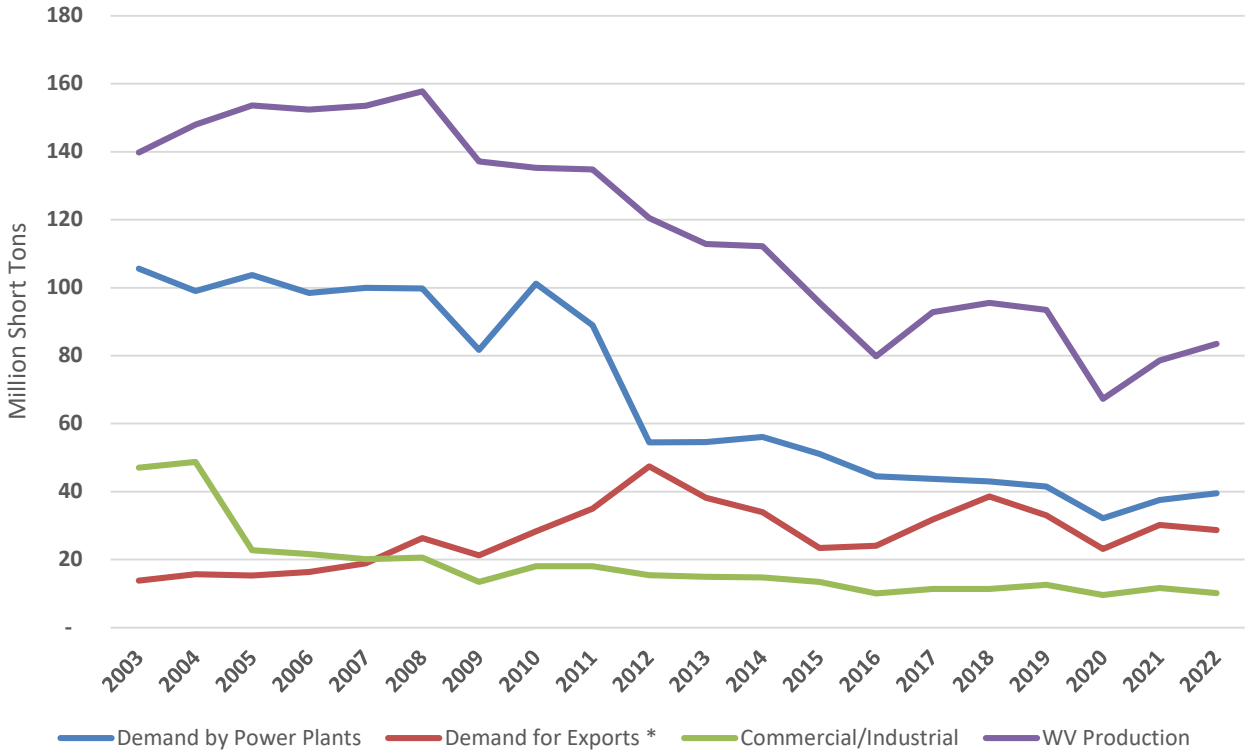
West Virginia coal production for 2022 was 83.5 million tons (EIA, 2023),[1] an increase from the 78.6 million tons produced in 2021. West Virginia's 2022 production is the highest figure since the start of the COVID-19 pandemic, though it is still below pre-pandemic levels. This increase reflects various trends and events within the coal industry's primary markets: power generation, exports, and industrial demand, as well as the return to normalcy from the COVID-19 pandemic. The demand for West Virginia coal increased 6.2% from 2021 levels, primarily from an increase in exports.

Future demand for West Virginia coal depends on several variables. These include the pace of economic recovery from the pandemic, the capacity of gas-fired electrical generators in the region and the price paid for gas by those generators, the lifespan and generation levels of the coal-fired power plants that will continue to burn coal from the State, the extent of new renewable generation, exchange rates, the rate of economic growth of countries that import

[1] 83.5 million tons is the Energy Information Administration's revised 2022 production value based on the final 2022 value published by MSHA (clean coal production reported on MSHA Form 7000-2). The West Virginia Office of Miner's Health, Safety and Training (WVOMHST) reports 2022 production of 96 million tons, but this may not be exclusively clean coal, which is the final production volume.

West Virginia coal, and the nature of compliance with environmental regulations. Recent demand trends with preliminary and estimated data for 2022 are shown in Figure 1.

Figure 1. Historical West Virginia Coal Production and Components of Demand



Source: EIA. Asterisked (*) 2022 volumes estimated by MU CBER. Other 2022 figures are preliminary by EIA.

The Electricity Sector

Preliminary coal distribution data for 2022, published by the U.S. Energy Information Administration (EIA), indicate that demand for West Virginia-produced coal by the electricity sector slightly increased in 2022, to about 39.5 million tons, compared to 37.6 million tons in 2021 (EIA 2023). This was an increase of 5.2 percent, while total US coal distribution to the electric power industry marginally increased by 2.0 percent during the same time (EIA 2023). In addition, WV distribution of coal to the electricity sector as a proportion of total US distribution has increased; in 2019 WV distributed about 7.5% of coal to the electricity sector, in 2022 that figure was 8.7%.

Natural Gas Prices

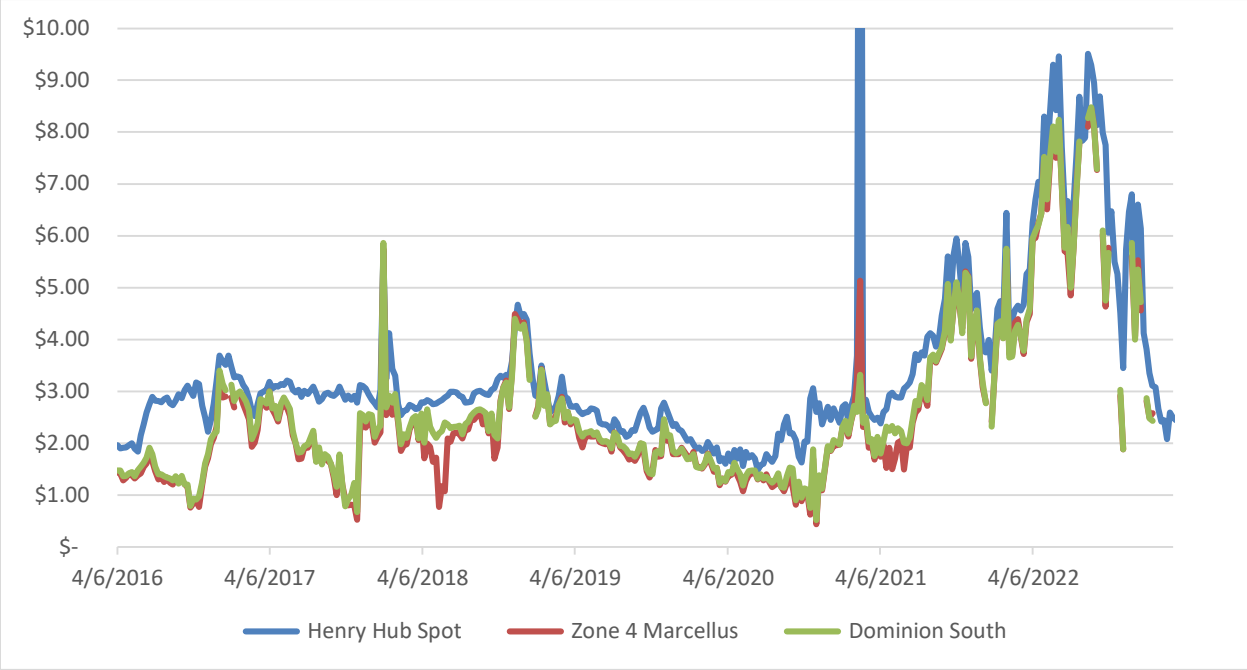
Historically, the price of natural gas has a direct relationship with the demand for coal; as natural gas prices rise, coal demand increases. From 2021 to 2022, the average price of gas delivered to the electric power sector increased sharply, averaging $5.17/mcf in 2021 (nominal dollars) and $7.52/mcf in 2022 (EIA 2022), a 45% increase. The past two years of natural gas

prices were significantly more expensive than recent historical prices, which averaged $3.17/mcf from 2017 to 2020. The rise can be attributed to the Russian invasion of Ukraine and its external affects, and demand increases, due in part to the economic recovery from the COVID-19 pandemic.

The 2021 to 2022 rise in natural gas prices correlated with increases in demand for West Virginia coal by power plants, with year-over-year increases in both years. Since January 2023, natural gas prices have returned to what are historically more normal levels.

For several years, abundant gas production from the Marcellus play, combined with relatively low takeaway capacity, resulted in especially low gas prices in a primary region in which West Virginia coal competes. The price differential of the Henry Hub Spot price to the Marcellus play has diminished but persists at times, as shown in the following chart of weekly prices at the two primary Marcellus area price hubs vs. the Henry Hub (Figure 2).

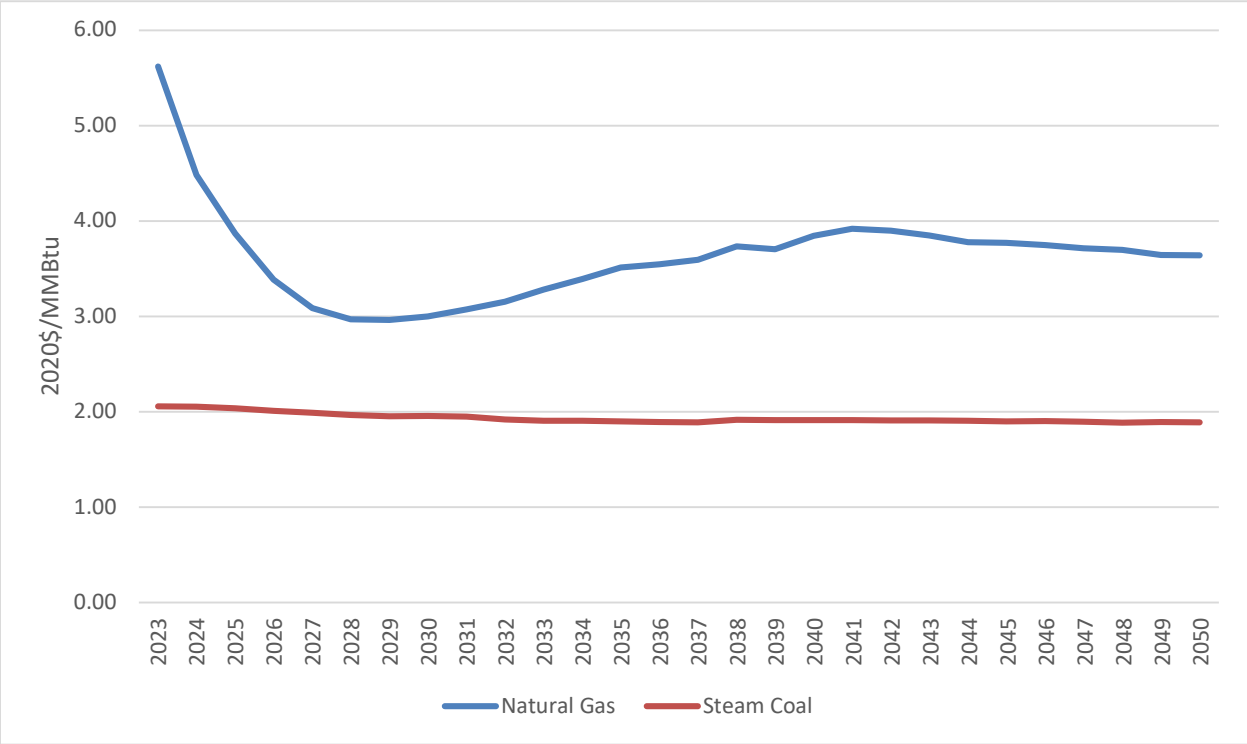
Figure 2. Select Marcellus Area Vs. Henry Hub Gas Prices ($/MMBTU)



Source: EIA, Natural Gas Weekly.

In its Annual Energy Outlook (AEO) 2023 Reference Case analysis, the EIA projects natural gas prices to sharply decline in the short-term. Much of this is due to assumptions about future policy changes impacting supply of Russian gas that would lower prices. Long-term, the EIA projects natural gas prices to climb and maintain between $3.50 to $4.00. Regarding coal, the EIA projects price of steam coal to slightly decrease but consistently maintain around $2.00/MMbtu with little to no volatility (Figure 3) (EIA 2023).

Figure 3. EIA Forecasted Natural Gas & Coal Prices to Electricity Sector



Source: EIA, AEO 2023.

Coal-Fired Power Plant Retirements

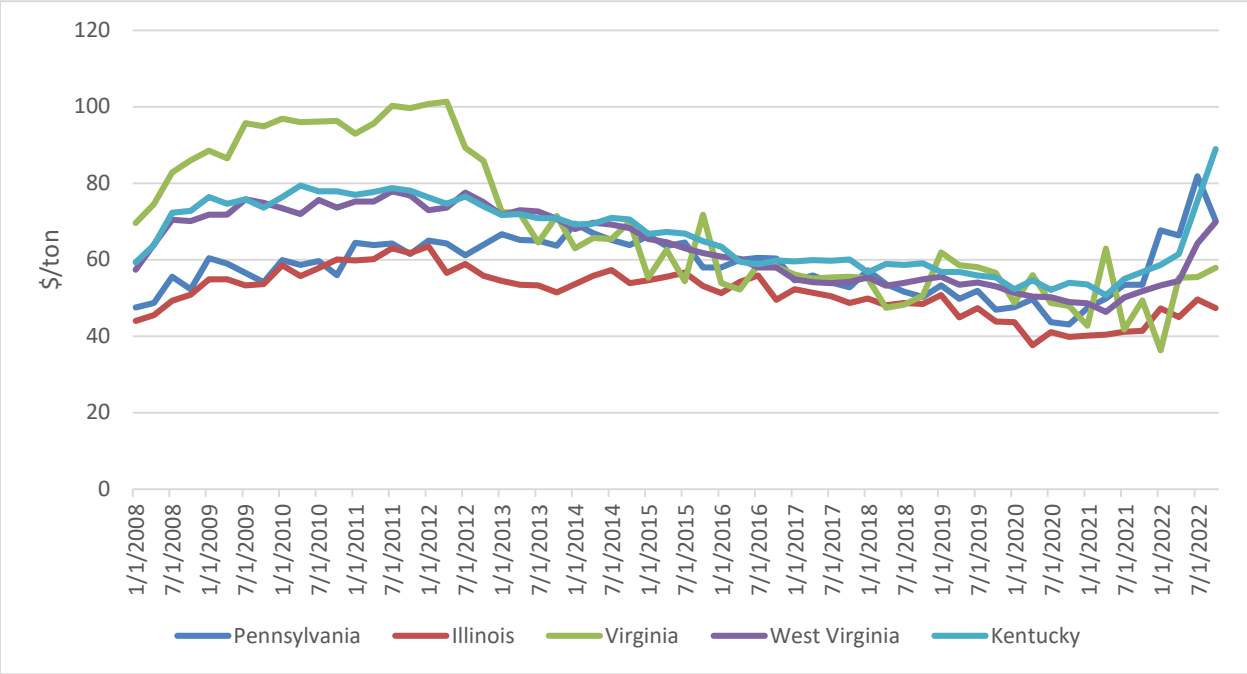
In recent years, many coal-fired power plants have retired, with several of those plants being consumers of West Virginian coal. In 2022, two major plants retired that were consumers of West Virginia coal, the William H. Zimmer plant (OH) - capacity of 1,305-megawatts (MW) - and the Morgantown Generating Station (MD) - capacity of 1,205 MW. In 2022, EIA released a report stating that coal will account for 85% of U.S. electric generating capacity retirements in 2022, with coal retiring 12.6 gigawatts of capacity.

Prices of Coal Delivered to the Electricity Industry

The price of West Virginia-produced coal delivered to power plants has largely been falling since around 2012. However, prices have increased since quarter 2 of 2021, and in quarter 4 of 2022 West Virginia experienced a spike close to the previous decade's high.

Average coal prices for regional producing states are much closer than in previous decades. Prior to 2013 West Virginia, Virginia, and Kentucky producers commanded a premium over coal produced from Pennsylvania and Illinois. By 2017 that premium had largely disappeared. However, the gap has come back for Illinois coal as that aggregate price has not increased at same levels as other states (Figure 4).

Figure 4. Coal Prices to the Electricity Industry by Mine State



Source: EIA, Quarterly Coal Report.

Environmental Regulation

The U.S. Environmental Protection Agency (EPA) has updated the Coal Combustion Residuals (CCR) rule. The rule requires power plants to monitor and inspect coal ash storage sites and to act if any leaks or other problems are detected. In November 2020, the EPA published the Part B Final Rule, which allows "facilities to demonstrate to EPA that, based on groundwater data and the design of a particular surface impoundment, the operation of the unit has and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment. EPA approval would allow the unit to continue to operate." The EPA is now proposing a process for facilities to seek additional time, if needed to address demonstrated grid reliability issues (Environmental Protection Agency, 2023).

The EPA is also proposing authority under the Clean Water Act (CWA) to reduce discharges of toxic metals and other pollutants from power plants into waterbodies. The proposed rule, Steam Electric Power Generating Effluent Guidelines (2023) would establish more stringent discharge standards for wastewaters generated at coal fired power plants. The EPA estimates the proposed regulation would reduce pollutants discharged through wastewater from coal-fired power plants by approximately 584 million pounds per year (EPA 2023).

The Inflation Reduction Act of 2022 offers funding, programs, and incentives to accelerate the transition to cleaner energy sources. This will also likely drive more deployment of clean

electricity resources - namely wind and solar power plants - which means there will be more competition for coal. Most provisions became effective on January 1, 2023 (EPA 2023).

The case Sackett vs EPA was ruled in May 2023. It concerns how the EPA determines its regulatory jurisdiction under the CWA. The decision sided with Sackett, with the majority arguing the CWA extends only to “wetlands with a continuous surface connection to bodies of water that are 'waters of the States’ in their own right.” Justice Kavanaugh- joined by three other justices- argued that the court is “rewriting of adjacent to mean adjoining.” Kavanaugh expressed concern that regulatory power from the CWA will decline and “produce consequences for the waters of the United States and will generate regulatory uncertainty.”

The Industrial Sector

As shown In Figure 1, demand for West Virginia coal by the industrial sector (coke plants and self-generating manufacturers, including coal-fired combined heat and power plants) have fluctuated around 11 million short tons since 2016. Coke plants have increased from the 2016 volume of 8.3 million short tons to 11 million short tons and 10.1 million short tons in 2021 and 2022, respectively. On the contrary, the industrial sector has decreased from a volume of 1.7 million short tons in 2016 to 0.7 million short tons in 2022.

In 2021, the U.S. imported 28.6 million metric tons (mmt) of steel, a 42.8% increase from 20 mmt in 2020. The U.S. steel trade deficit amounted to 21 mmt, a 50% increase from 13.9 mmt in 2020. Imports from Russia (280%) showed the largest volume increase in 2022, followed by Vietnam (198%), Turkey (81%), Taiwan (54%) and Mexico (44%) (ITA, 2023).

Exports

The nation’s coal exports have risen since 2020, increasing from 69 million short tons in 2020 to 84.8 million short tons in 2022, but remains significantly less than in previous decades.

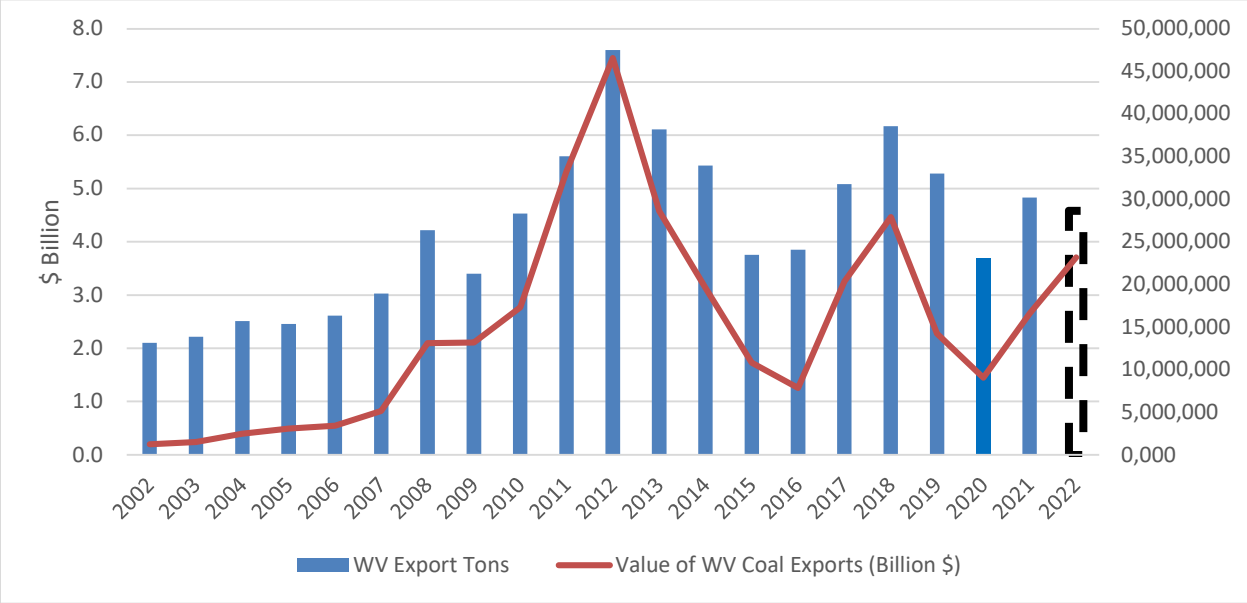
Likewise, West Virginia’s coal export volumes have increased, from 23.1 million short tons in 2020 to 28.7 million short tons in 2022. Contrary to the U.S. as a whole, West Virginia’s export volume remains relatively strong compared to historical levels back to 2002.[2]

The value of coal exports from West Virginia increased from $2.7 billion in 2021 to $3.7 billion in 2022, the second highest figure since 2014. The state maintained high-level exports to many countries in North America, Europe, South America, Africa, and Asia. The top five importing countries by value were India, the Netherlands, Brazil, Japan, and the United Kingdom (ITA,

[2] 2022 data for coal export tonnage by U.S. state of origin has not yet been released. CBER estimates West Virginia’s exports based on historical shares of total exports and the value of coal exports from the state.

2023). Figure 5 shows the value of West Virginia-based coal exports and associated tonnage from 2002 to 2022.

Figure 5. Value and Tonnage of West Virginia Coal Exports, 2002-2022



Source: EIA, ITA; 2022 export tonnage estimated by CBER.

Component Forecasts

Energy Information Administration (EIA)

Publication: Annual Energy Outlook 2023

Date: March 2023

Forecast Horizon: 2022-2050

Region(s): Northern Appalachia, Central Appalachia

The EIA provides a forecast of coal production by region in its 2023 Annual Energy Outlook, projecting through 2050 via its National Energy Modeling System (NEMS). NEMS uses a market-based approach that balances energy supply and demand while considering regulations and industry standards. NEMS is a modular system, with modules that represent each of the fuel supply markets, conversion sectors, and end-use consumption sectors of the energy system (EIA, 2023).

Only the EIA Reference Case figures are used for the Consensus forecast, which represents EIA's 'best assessment of how U.S. and world energy markets will operate through 2050." This projection assumes improvement in known energy production, delivery, and consumption technology trends (Energy Information Administration, 2023).

The EIA's forecasts for Appalachia are used to create an EIA forecast for West Virginia coal production. The method used is described in Appendix B.

Key Assumptions:

Macroeconomic Issues: Real GDP growth averages 1.9% per year from 2022 to 2050.

Coal Prices: EIA projects the average mine mouth price for all coals to be about $38/ton in 2022 (2022$) and to rise to $65 by 2050.

Natural Gas Prices: Henry Hub[3] spot prices are expected to be about $6.52 in 2022, sharply decline to a bottom of $2.80, then slowly rise resulting in an expected price of $3.77/MMBtu in 2050. The long-term annual growth would be -1.90%.

Electricity: U.S. use of coal for production of electricity is expected to decline by 4.1% annually through 2050. Coal-fired generating capacity is expected to decrease at a rate of 3.7 percent

[3] The Henry Hub in Louisiana is the delivery point for the natural gas futures contract on the New York Mercantile Exchange.

per year through 2050. By comparison, combined cycle (natural gas) capacity is projected to increase by 0.6% per year and renewable capacity to increase by 4.9 percent per year.

Industrial/Commercial: Industrial self-generators (CHP plants, power plants with a non-regulatory status, and small on-site generating systems) are expected to see a decrease in coal consumption of 1.4 percent per year through 2050. Coal use in coke plants is projected to decrease by 0.5 percent per year. The commercial sector is expected to maintain flat coal consumption of one million tons per year.

Exports: U.S. coal exports are projected to rise from 85 million tons in 2022 to 130 million tons in 2025, and to continue rising to 161 million tons in 2035 and 217 million tons in 2045.

Environmental: The AEO2023 includes the effects of current legislation, environmental regulations, and international protocols including recent government actions for which implementing regulations were available as of the end of November 2022. This includes the new Federal laws and regulations such as the Inflation Reduction Act (IRA)- which provides tax credits for clean energy and more- that passed in August 2022. In addition, Illinois, North Carolina, Nebraska, and Rhode Island enacted new legislation for their clean energy standards (CES) programs. Lastly, the AEO2023 includes CES executive branch targets for Colorado, Connecticut, Louisiana, Massachusetts, Michigan, New Jersey, and Wisconsin (EIA, 2023).

Energy Ventures Analysis (EVA)

Publication: EVA Long-Term Forecast

Date: April 2023

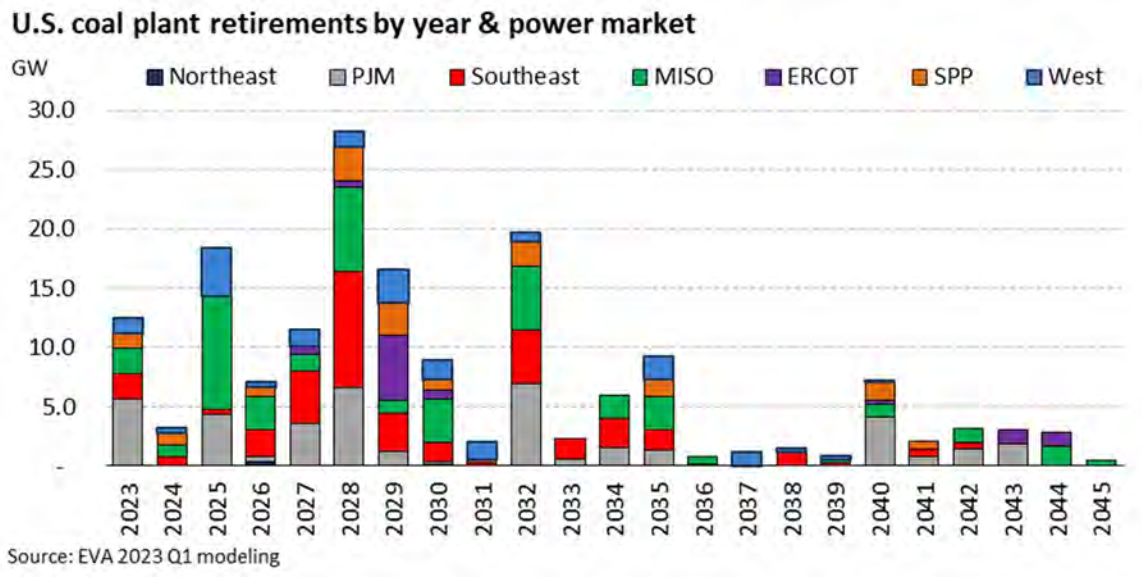
Forecast Horizon: 2023-2050

Region(s): All states

EVA utilizes the AURORAxmp 24/7 dispatch model (which EVA licenses) to calculate electricity generation by fuel type. The forecast reflects the least cost dispatch solution consistent with the operating parameters of individual units and regulatory requirements. Existing generation, planned generation deemed to be likely to be constructed, and announced retirements are reflected. In addition, the model adds and retires capacity in an economic manner and as required by law.

Key Assumptions:

Coal Plant Retirements: Due to renewed environmental pressure from the current administration, e.g., the Good Neighbor Rule, NAAQS for fine particulates, Coal Combustion Residuals, and Effluent Limitations guidelines, coal retirements will likely continue at an accelerated rate through the 2020s and early 2030s. They will congregate around EPA compliance deadlines for the various rules.



Coal Prices: Coal prices vary by region, coal quality, and market and were relatively high in 2022 due to the strength in the global market and economic growth due to recovery from COVID.

Going forward real prices are expected to increase and soften modestly throughout the forecast period. Future pricing also reflects the higher cost of capital related to the reduced access to capital due to environmental, social, and governance (ESG) concerns.

Natural Gas Prices: Like coal, Henry Hub gas prices jumped in 2022, softening since then. The very mild winter of 2022/2023 reduced gas demand, resulting in lower gas prices and coal displacement in the power sector. Nominal natural gas prices are expected to increase in the long-term but will vary due to sensitivity to weather conditions.

Electricity: Growth in electricity demand is expected to average 1.0% per year. This rate of growth is higher than in prior years due to the expected impact of electric vehicles on demand. Utility demand for coal is expected to decline from about 460 million tons in 2022 to less than 100 million tons by 2050. The decline is heavier in the early years as plants are retired.

Industrial/Commercial: Demand from other sectors is also expected to decline, reflecting industrial plant conversions from coal to natural gas and reduced metallurgical coal in steelmaking as the industry continues to shift from blast furnace to electric arc furnace production. All coal supply regions are affected as industrial plants are retired. However, all domestic metallurgical coal is expected to originate in Appalachia.

Exports: U.S. export levels are a function of the competitiveness of U.S. coals which in turn is affected by the relative strength of the U.S. dollar particularly with respect to the Australian dollar as global coal trade is U.S. dollar denominated and Australia is the largest exporter of bituminous coals. The U.S. exports both steam and metallurgical coals, but U.S. metallurgical coal exports exclusively originate in Appalachia. While global metallurgical coal demand is expected to decline, some continued blast furnace production is expected through 2050.

Steam coal exports are largely expected from Northern Appalachia, the Illinois Basin, the Powder River Basin, and the Rockies. Central Appalachia is believed to be not economic long-term and therefore unlikely to participate except in unusual circumstances. While the U.S. continues to be a swing supplier, contraction in the global coal industries has given it a larger role. The war in Ukraine increased U.S. exports to Europe as Russian coal was diverted to Asia, and the loss of natural gas from the Nord Stream pipelines increased demand for coal.

Environmental: Coal Combustion Residuals (CCR) and Effluent Limitation Guidelines (ELGs) are assumed to go into effect according to their regulatory schedules. Plants which are not expected to comply are assumed to be retired. Federal carbon limitations are not assumed. Compliance is assumed with announced state/regional plans. Pennsylvania is no longer assumed to join the Regional Greenhouse Gas Initiative (RGGI). The caps in AB32 (California) are assumed to be extended through 2050. The Inflation Reduction Act is implemented.

Marshall University Center for Business and Economic Research (CBER)

Publication: CBER West Virginia Coal Production Forecast 2023

Date: April 2023

Forecast Horizon: 2023-2045

Region(s): West Virginia

MU CBER's forecast was conducted by Dr. Avishek Mallick of the Marshall University Mathematics Department. The forecast is a Vector Autoregression (VAR) model with seasonality adjustment using quarterly data from 2008-2022.

Key Assumptions:

This VAR model is a demand-based model. It forecasts coal production using several price and demand related variables (Table 1). All variables (both impulse and response) were considered endogenous and modeled as first order Autoregressive Process (AR1).

The CBER forecast does not impose any macro- or micro-economic assumptions that may be subject to exogenous shocks in the future.

Table 1. Variable Description and Data Source

Variable	**Source**
WV Total Coal Production	EIA
Total WV Coal Delivered to the Electricity Industry	EIA
Delivered WV Coal Prices for Power Generation	EIA
Delivered US Natural Gas Prices for Power Generation	EIA
Euro/Dollar Exchange Rate	Macrotrends

West Virginia University Bureau for Business and Economic Research (BBER)

Publication: WVU BBER Coal Production Forecast 2023

Date: May 2023

Forecast Horizon: 2023-2050

Region: Northern West Virginia and Southern West Virginia

The WVU Bureau of Business and Economic Research Coal Production Forecast is an econometric model based upon changes in factors that affect the demand and price for coal sourced from mines in Northern and Southern West Virginia between 1985 and 2022. Historical data on coal prices, production and other energy-related data are obtained from a variety of Energy Information Administration reports. Forecasts for US-level explanatory variables were taken from the S&P Global Intelligence (formerly HIS) March 2023 Long-Term Forecast and the 2023 Annual Energy Outlook from the Energy Information Administration (West Virginia University, 2023).

Consensus Forecast

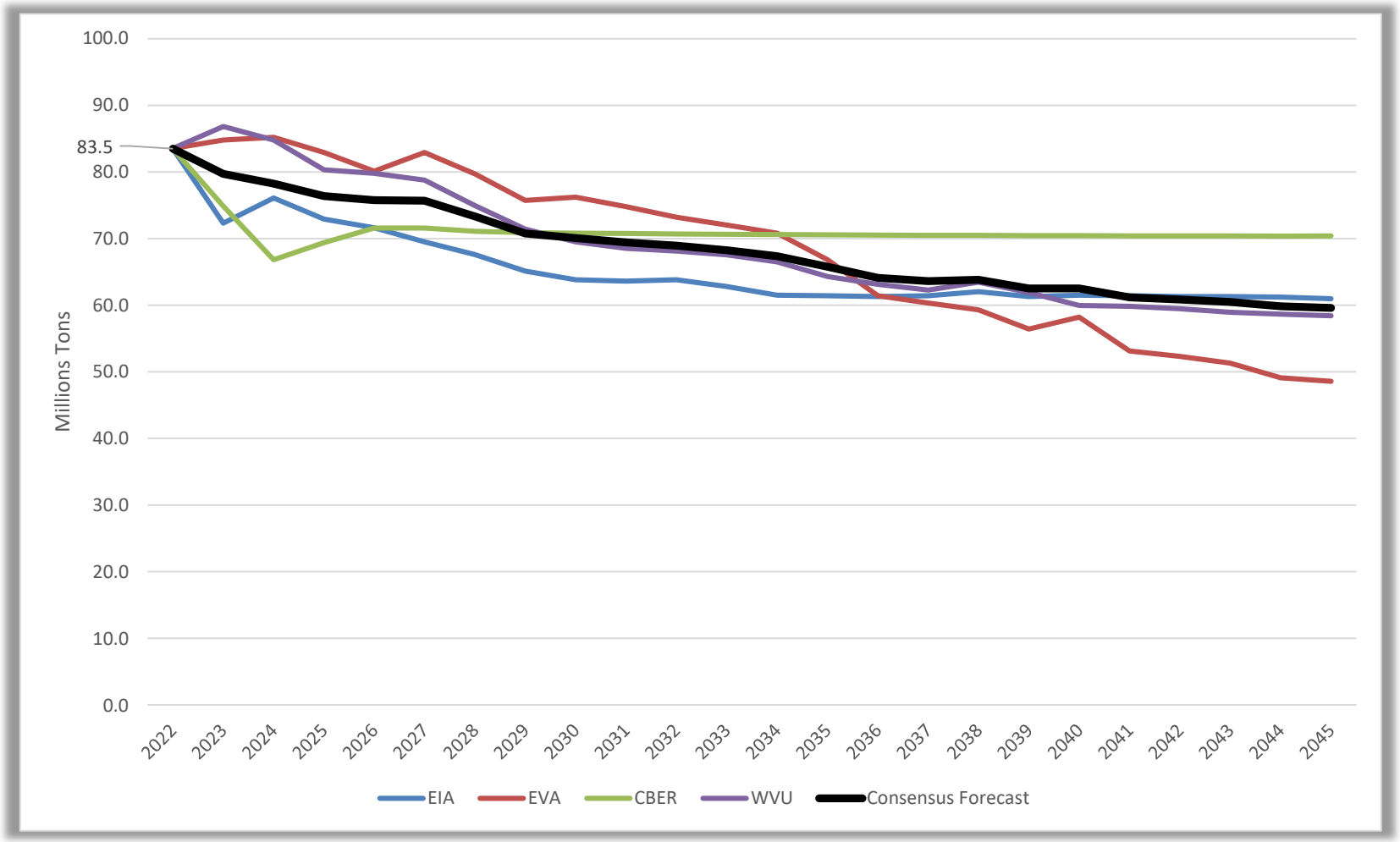
The four long-term forecasts produced by EIA, EVA, CBER, and BBER are combined to create the 2023 Consensus Forecast for West Virginia Coal Production. For simplicity, a simple average was used to calculate the consensus forecast[4] (Figure 6 and Table 2). Coal production in West Virginia is projected to decline from 83.5 million tons in 2022 to 79.7 million tons in 2023, followed by a steady decline to about 59.6 million tons in 2045.

Summary

The four component models incorporate a range of possible levels of West Virginia coal production over the next 22 years, with varying forecasts that illustrate the impact of primary supply and demand variables and uncertainty over the continuation of recent trends. The consensus reduces uncertainty by combining the forecasts into one aggregate projection. The consensus forecast predicts West Virginia will experience a gradual decline in coal production throughout the period, but at levels that are four to seven million tons per year higher than the 2021 Consensus Forecast.

[4] Due to the subjective nature of weight selection, a simple average approach (with same weight for all four forecasts) would generate a very similar forecast as the weighted average but does not require additional (often unrealistic) assumptions to estimate accuracy rate of historical forecasts.

Figure 6: Consensus and Component Forecasts 2023 (million tons)



Source: EIA, EVA, WVU BBER, and authors' calculations.

Table 2: Consensus Forecast for West Virginia Coal Production 2023 (million tons)

Year	Historical	2023 Forecasting Group				2023 Consensus	2021 Consensus	2019 Consensus	2017 Consensus	2016 Consensus
		EIA	EVA	CBER	BBER					
2017	92.8								*86.8*	*76.9*
2018	95.1								*83.6*	*74.7*
2019	92.4							*91.1*	*84.1*	*76.7*
2020	67.2							*88.3*	*87.1*	*80.1*
2021	78.6						*79.4*	*84.4*	*86.1*	*78.6*
2022	83.5						*81.6*	*84.1*	*85.9*	*75.7*
2023		72.3	84.8	74.8	86.8	79.7	*79.3*	*83.3*	*84.7*	*73.1*
2024		76.1	85.2	66.8	84.8	78.2	*74.7*	*82.3*	*82.8*	*70.3*
2025		72.9	82.9	69.4	80.3	76.4	*72.6*	*81.2*	*81.5*	*69.1*
2026		71.6	80.1	71.6	79.8	75.8	*70.9*	*80.7*	*80.2*	*67.9*
2027		69.5	82.9	71.6	78.7	75.7	*69.3*	*80.0*	*79.3*	*66.2*
2028		67.6	79.7	71.1	75.0	73.3	*66.8*	*78.8*	*77.7*	*64.5*
2029		65.1	75.7	70.9	71.4	70.8	*64.7*	*78.7*	*76.8*	*63.0*
2030		63.8	76.2	70.8	69.5	70.1	*64.0*	*77.6*	*76.3*	*61.7*
2031		63.6	74.8	70.7	68.5	69.4	*62.7*	*76.8*	*76.1*	*62.1*
2032		63.8	73.2	70.7	68.1	68.9	*62.2*	*76.1*	*76.0*	*62.9*
2033		62.8	72	70.6	67.6	68.2	*61.9*	*75.3*	*76.6*	*63.3*
2034		61.5	70.8	70.6	66.5	67.3	*61.6*	*74.0*	*76.7*	*63.1*
2035		61.4	66.8	70.5	64.3	65.8	*61.2*	*73.5*	*76.6*	*62.5*
2036		61.3	61.4	70.5	63.1	64.1	*60.0*	*73.4*	*76.5*	*62.3*
2037		61.4	60.3	70.5	62.3	63.6	*59.6*	*73.1*	*76.1*	*60.4*
2038		62	59.3	70.5	63.5	63.8	*59.3*	*72.6*	*75.6*	*59.7*
2039		61.3	56.4	70.4	61.9	62.5	*58.8*	*72.0*	*75.8*	*58.6*
2040		61.5	58.2	70.4	59.9	62.5	*58.6*	*71.2*	*75.3*	*57.1*
2041		61.4	53.1	70.4	59.8	61.2	*57.2*	*70.7*		
2042		61.3	52.3	70.4	59.4	60.9	*56.4*	*70.4*		
2043		61.3	51.3	70.4	58.9	60.5	*56.0*	*70.3*		
2044		61.2	49.1	70.4	58.7	59.8	*55.2*	*70.1*		
2045		61.0	48.6	70.4	58.4	59.6	54.7	69.9		

Source: EIA, EVA, WVU BBER, and authors' calculation. All forecasts were produced in 2023.

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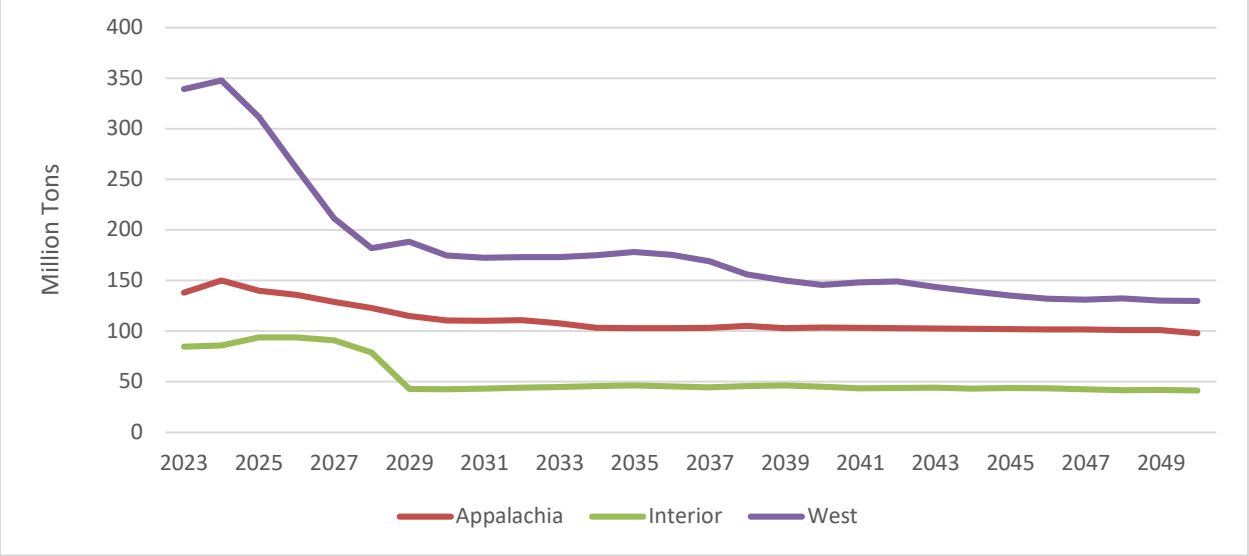
Appendix A: EIA Forecasts for Regional Coal Production

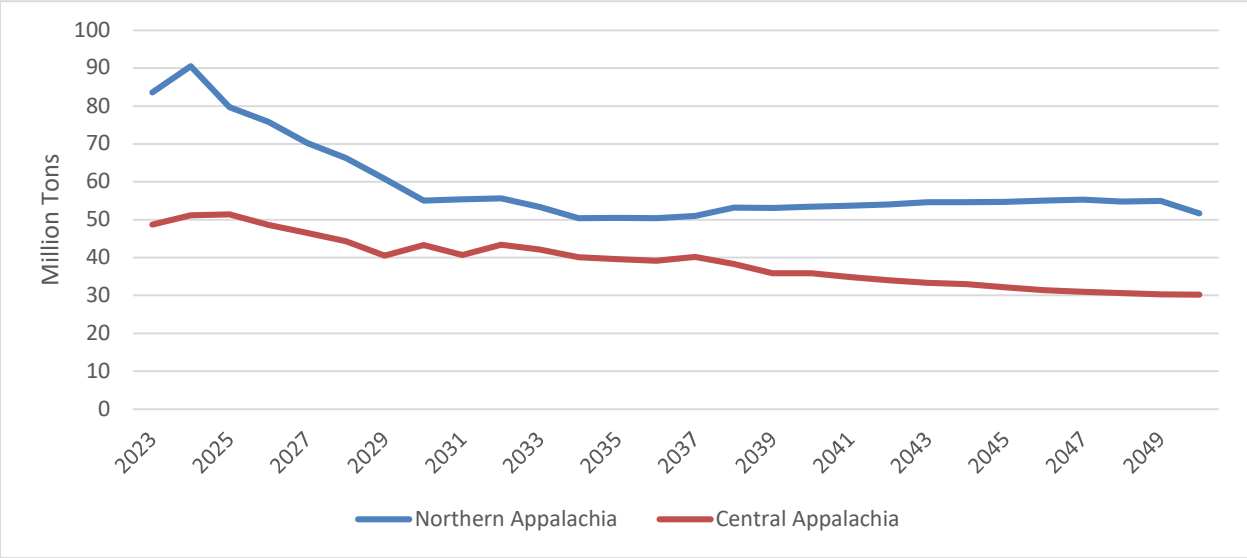
EIA forecasts Appalachian coal production to decline gradually through 2032, with greater stability from 2032 to 2050. As shown below (Figure A1), Interior[5] production is projected to have moderately less production compared to Appalachian production throughout the period. Northern Appalachian[6] (Figure A2) production is expected to rapidly decrease, reducing the difference between Northern Appalachia and Central Appalachia. It is expected for Northern to decrease production from 91 million short tons to 53 million short tons by 2033 and fluctuate at similar levels through 2050. On the contrary, Central Appalachia is projected to gradually decrease production to 42 million short tons in 2033 and then 30 million short tons in 2050. There is a projected 20-million-ton difference between the two Appalachian regions for most years.

Figure A1. EIA Forecasted Coal Production by Region



[5] Arkansas, Illinois, Indiana, Iowa, Kansas, W. Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, and Texas.
[6] Northern Appalachia includes Pennsylvania, Maryland, Ohio, and N. West Virginia. Central Appalachia includes Virginia, E. Kentucky, N. Tennessee, and S. West Virginia.

Figure A2. EIA Forecasted Coal Production for Northern and Central Appalachia

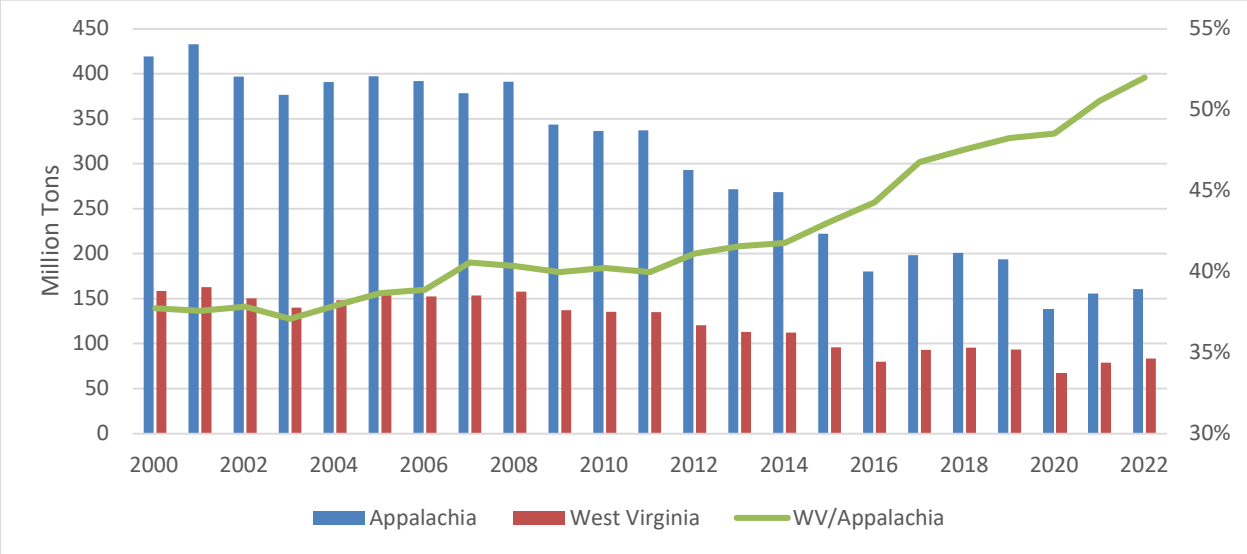


Source for Figure A1 and Figure A2: EIA AEO 2023.

Appendix B. EIA Forecast for West Virginia

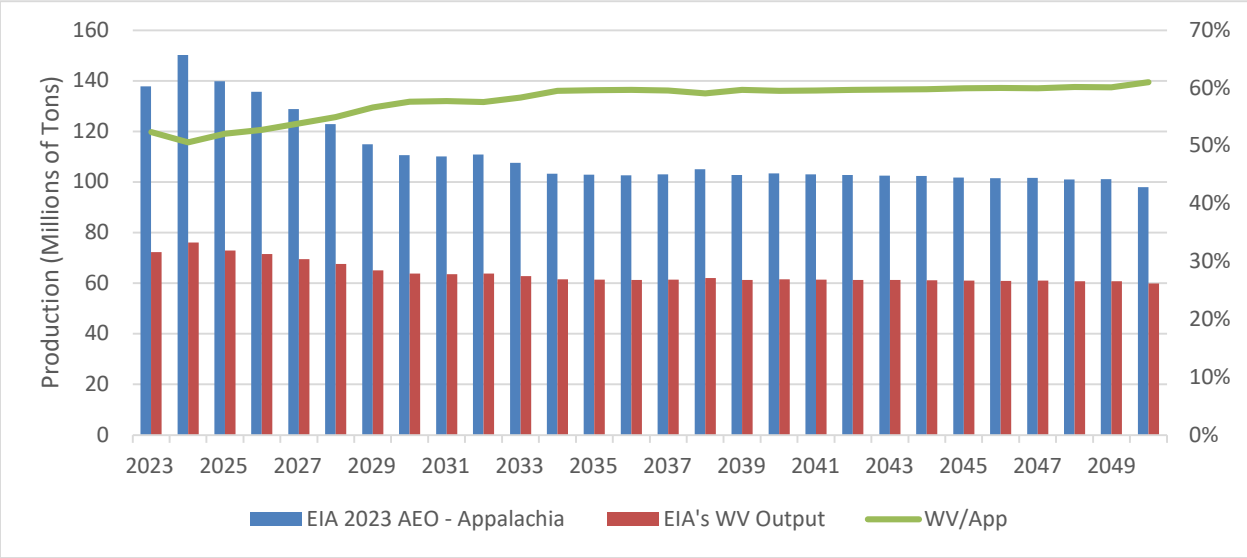
The EIA forecast for WV coal production is derived from EIA's forecast for the Appalachia region, as the agency does not publish forecasts for individual states. The WV forecast was calculated using year-adjusted WV/Appalachia coal production.

Figure A3. EIA Appalachian and West Virginia Historical Coal Production



Source: EIA AEO 2023 and CBER calculations for West Virginia production.

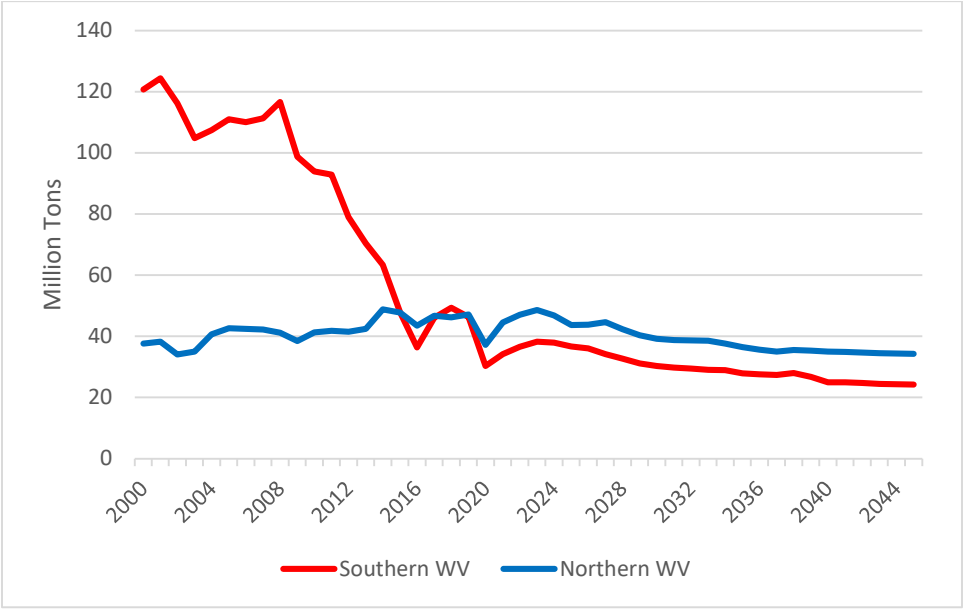
Figure A4. EIA Appalachian Forecasts Applied to West Virginia Coal Production



Source: EIA AEO 2023 and CBER calculations for West Virginia production.

Appendix C. WVU BBER Forecast of Northern vs. Southern WV Production

Figure A5. WVU BBER Forecast of Northern vs. Southern WV Production



Appendix D

Taylor&Mulder

Property and Casualty Consulting Actuaries

West Virginia Office of Special Reclamation

Actuarial Reserve Study as of June 30, 2023

October 2023

10508 Rivers Bend Lane, Potomac, MD 20854 t (301) 365-4800 f (301) 36 5-4882 e contact@taylorandmulder.com w taylorandmulder.com

Taylor&Mulder
Property and Casualty Consulting Actuaries

10508 Rivers Bend Lane,
Potomac, MD 20854

t (301) 365-4800 f (301) 365-4882
e contact@taylorandmulder.com

w taylorandmulder.com

October 10, 2023

Mr. Matthew Butler
Deputy Director
Division of Land Restoration
West Virginia Department of Environmental Protection
Office of Special Reclamation
47 School Street Suite 301
Phillipi, WV 26416
Matthew.L.Butler@wv.gov

Dear Mr. Butler,

Enclosed is the actuarial review of the West Virginia Department of Environmental Protection ("WVDEP") Special Reclamation Fund and Water Trust Fund ("SRF" and "WTF", respectively, or collectively "the Funds") as of June 30, 2023.

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, ACAS, MAAA, CSPA, FCA
Enclosures

West Virginia Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023

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Executive Summary

Purpose and Scope

Taylor & Mulder, Incorporated ("T&M") was requested by the West Virginia Department of Environmental Protection ("WVDEP") to conduct an actuarial review of its loss reserves as of June 30, 2023. This report contains our summary and conclusions along with a description of the analysis underlying our conclusions.

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

- A valuation in accordance with applicable actuarial standards of practice promulgated by the Actuarial Standards Board of the American Academy of Actuaries that will determine the Program's fiscal soundness;
- An evaluation of the present assets and liabilities of the Special Reclamation Program for a minimum of 20 years, including an annual table illustrating those assets and liabilities for underground versus surface mine permits, small versus large permits (based on bond amounts or acreage) and permits for tipples, preparation plants, and impoundments and illustrating land and water liabilities separately;
- An evaluation of the prospective assets and liabilities of the Special Reclamation Program for a minimum of 20 years, including a table illustrating estimates of underground versus surface mine permits, small versus large permits (based on bond amounts or acreage) and permits for tipples, preparation plants, and impoundments and illustrating land and water liabilities separately, including the funded status of the Water Trust Fund ("WTF") as well as the Special Reclamation Fund ("SRF");
- A table that combines the findings of the two previous tasks;
- An analysis and discussion of the ability of the Program to support long term and/or perpetual liabilities; and,
- A one-page executive summary of conclusions with references to the body of the report.

Note: This is a "closed" valuation of the Funds' liabilities insofar as it considers only liabilities arising from permits that have already been issued. The estimated liabilities account for current

known reclamation projects as well as anticipated permit revocations on permits issued prior to June 30, 2023. Anticipated income is also linked to permits issued by June 30, 2023 without regard to future permits issued.

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, FCA, CSPA, Vice President and 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 undiscounted liabilities for land reclamation costs, water capital costs, maintenance and operations costs, and administrative expenses for the next 20 years:

West Virginia Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Special Reclamation Fund and Water Trust Fund Combined
Undiscounted Liabilities

Expense Category	Current Forfeitures	Prospective Forfeitures	Total Liability
Land Reclamation Costs	28,294,342	91,970,150	120,264,492
Water Capital Costs	44,313,589	88,016,419	132,330,008
O&M Costs*	122,414,879	23,988,658	146,403,536
Administrative Expense			63,308,707
Total Liability	**195,022,809**	**203,975,226**	**462,306,742**

*O&M Costs are Operation and Maintenance Costs

It should be noted that because this is a "closed" study, the above table does not include anticipated liabilities arising from permits issued after June 30, 2023.

Administrative expenses in the above table include employee benefits, contractual obligations, personnel services, and unclassified expenses other than reclamation costs. The following table shows the estimated total liability from all forfeitures (current and projected) for the next 20 years, as well as a comparison to the same values projected as of the previous study:

West Virginia Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Special Reclamation Fund and Water Trust Fund Combined
Undiscounted Liabilities

Expense Category	Current Study	Prior Study	Difference
Land Reclamation	120,264,492	99,746,231	20,518,261
Water Capital	132,330,008	225,077,369	(92,747,361)
Water O&M	146,403,536	180,831,780	(34,428,244)
Administrative*	63,308,707	59,166,576	4,142,131
Total	**462,306,742**	**564,821,955**	**(102,515,213)**

Relative to the prior study, the current study anticipates higher land reclamation and administrative expenses. Water capital liabilities declined significantly due to decreases in outstanding costs for currently contracted work. For example, on an uninflated basis, the current scheduled water capital

liabilities total $42.8 million, down from $116.3 million. The projected future water capital liabilities through 2043 have increased from $67.2 million to $68.9 million. Changes in land reclamation and water O&M liabilities were likewise driven primarily by changes in current scheduled expenditures.

A detailed breakdown of these liability cash flows is provided in Exhibits E-6 through E-9.

Funds' Assets

In addition to projecting the Funds' liabilities, we also projected the Funds' assets. This was performed in the context of modeling future fiscal year cash flows. The following chart shows anticipated revenues over the next 20 years:

West Virginia Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Projected Revenues for SRF and WTF

Revenue Category	20 Years
Bond Forfeitures	42,614,042
Civil Penalties	9,220,872
SRF Coal Fees	115,749,766
WTF Coal Fees	134,592,752
SRF Investment Yield	3,140,328
WTF Investment Yield	155,062,799
Total	**460,380,558**

Note that due to the closed nature of the study, the revenues in the table above only reflect projected revenues associated with currently in-force permits. The actual anticipated revenues over that time period are considerably higher. For example, the SRF and WTF coal fees included in the table above represent only 66% of the total anticipated coal production over the next 20 years, as coal production in future years will increasingly come from permits that have not yet been issued as of June 30, 2023.

Relatedly, it should be noted that the actual investment yield will vary based on the rate at which funds must be transferred from the WTF to the SRF to pay for liabilities. Because the WTF earns a higher investment yield than the SRF (projected 4.9% as compared to 1.5%), additional revenues in the SRF (for example, from coal tonnage fees associated with new permits that are outside the scope of our study) will have a significant positive impact on total investment yield over time. This

is because less money will need to be transferred from the WTF to the SRF to pay for reclamation activities, and therefore more investment income can be earned.

Technical details regarding how each revenue category was projected are provided in **Appendix A**, below. Revenue projection details are provided in Exhibits E-3 through E-5.

Financial Projections

Our projections of revenues and expenses to the Funds imply that the Funds will be solvent on a cash basis through 2043. The chart on the following page shows a simplified cash flow projection for the SRF and WTF combined over the next 20 years.

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Financial Projection

Fiscal Year	Total	Total	Beginning Balance		WTF to SRF	Ending Balance	
Ending 6/30	Expenditures	Revenues	SRF	WTF	Transfers	SRF	WTF
Prior						12,934,042	154,739,346
2024	39,615,668	32,603,795	12,934,042	154,739,346	22,833,468	10,000,000	150,661,516
2025	42,184,937	30,616,202	10,000,000	150,661,516	29,300,781	10,000,000	139,092,781
2026	11,046,333	28,797,313	10,000,000	139,092,781	-	11,170,253	155,673,508
2027	20,952,390	28,614,142	11,170,253	155,673,508	8,095,112	10,000,000	164,505,514
2028	28,814,113	27,550,682	10,000,000	164,505,514	17,918,775	10,000,000	163,242,083
2029	24,907,691	26,091,394	10,000,000	163,242,083	14,749,292	10,000,000	164,425,786
2030	23,987,455	25,221,103	10,000,000	164,425,786	14,338,160	10,000,000	165,659,433
2031	29,887,602	24,407,258	10,000,000	165,659,433	20,720,389	10,000,000	160,179,089
2032	22,114,964	23,358,819	10,000,000	160,179,089	13,382,890	10,000,000	161,422,944
2033	21,825,983	22,644,665	10,000,000	161,422,944	13,523,468	10,000,000	162,241,626
2034	21,555,157	21,919,509	10,000,000	162,241,626	13,675,221	10,000,000	162,605,978
2035	21,031,153	21,115,894	10,000,000	162,605,978	13,598,227	10,000,000	162,690,720
2036	20,687,990	20,314,433	10,000,000	162,690,720	13,692,724	10,000,000	162,317,162
2037	20,069,436	19,727,209	10,000,000	162,317,162	13,395,658	10,000,000	161,974,935
2038	19,761,325	19,277,469	10,000,000	161,974,935	13,341,582	10,000,000	161,491,079
2039	19,336,085	18,623,470	10,000,000	161,491,079	13,263,532	10,000,000	160,778,464
2040	18,951,808	18,175,839	10,000,000	160,778,464	13,119,669	10,000,000	160,002,494
2041	18,853,246	17,571,998	10,000,000	160,002,494	13,332,207	10,000,000	158,721,246
2042	18,490,579	17,105,464	10,000,000	158,721,246	13,200,570	10,000,000	157,336,131
2043	18,232,826	16,643,900	10,000,000	157,336,131	13,165,970	10,000,000	155,747,204

Note that these projections assume that the Water Trust Fund transfers money to the Special Reclamation Fund in order to maintain a fund balance of $10,000,000.

A detailed version of this financial projection is provided in Exhibit E-2, which shows the breakdown by type of undiscounted expenditure and revenue item.

Recommendations

Coal Production Risks: There has been some instability in coal production forecasts and the coal market in general over the preceding decade as a result of different regulatory regimes, alternative energy adoption rates, economic events, and, most recently, the COVID-19 pandemic. Future studies may benefit from considering alternative coal production scenarios.

Permit Status History: Permit databases were evaluated as of a specific date. However, because this study estimates anticipated changes in permit status over time, it is necessary to make assumptions about how permit statuses change in order to develop forfeiture models. If records exist, it could be possible to produce more accurate models if a full history of each permit (including all status changes over time and dates when status changes occurred) were available.

Background

On August 3, 1977, Congress enacted the Surface Mining Control and Reclamation Act of 1977 ("the SMCRA") to encourage the reclamation of mined areas and return land and water resources to beneficial use. The SMCRA established a program for the regulation of mining permits and a program for reclaiming bond forfeiture sites. In West Virginia, reclamation of abandoned mine lands is performed by the West Virginia Department of Environmental Protection ("WVDEP") Office of Special Reclamation.

Funding for the reclamation of mined areas comes from bond forfeitures, coal tonnage fees, civil penalties, and interest income. The largest of these funding sources is coal tonnage fees. Coal tonnage fees of $0.15 per ton of coal mined are deposited in the Water Trust Fund ("WTF") and $0.129 per ton are deposited in the Special Reclamation Fund ("SRF"). Amounts from bond forfeitures go to the SRF.

Currently, all reclamation activities, including water treatment, are paid through the SRF, with amounts being transferred to the SRF from the WTF to fund payment of certain costs. Financial projections assume that funds will be transferred to the SRF to maintain a certain minimum balance of working capital, and that the remaining amounts will be left in the WTF to achieve a higher average investment yield.

Report Distribution and Use

This report has been prepared for internal use by the management of the WVDEP and its board, its accountants, auditors, and attorneys, and the West Virginia legislature. The WVDEP 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 and 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 WVDEP 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.

WVDEP claim reserving procedures, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the WVDEP, 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 WVDEP 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 WVDEP 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 WVDEP 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 WVDEP 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.

Appendix A: Actuarial Analysis

Sources of Data

The data underlying our analysis was compiled from several sources. The following are the primary sources from which data was taken and how each data source was used:

- Special Reclamation Database: This database was provided by David B. McCoy, Engineer-Chief, Division of Land Reclamation. The database includes information pertaining to historical and ongoing reclamation projects in the state, including site characteristics, land use information, anticipated and actual land and water reclamation costs (both individual capital expenditures and ongoing costs), and administrative costs.
- Permits database: This database was provided by Amy Crouser, Assistant Director for the WVDEP Division of Mining and Reclamation. This database includes data on permits issued between 1961 and June 30, 2023, including the permit status, permit location and type, bond amount, and bonded acres.
- 2023 Consensus Coal Forecast by the Center for Business and Economic Research at Marshall University was used for coal market history and projections.
- Special Reclamation Fund Expenditures: This database was provided by Scott Fairchild, Financial Reporting Specialist (II) for the WVDEP. This database included SRF and WTF expenditures from July 1, 2005 to June 30, 2023.
- Revenues for WTF and SRF were also provided by Scott Fairchild. These databases include all revenues to the Special Reclamation Fund and Water Trust Fund from July 1, 2005 to June 30, 2023.
- Prior Actuarial Reports: These were provided by Mr. Sheehan to provide additional context for our projections.
- Coal Production Decline Rates, including an analysis of anticipated coal production decline rates, was provided by John Morgan, indicating the anticipated rate at which coal production will decline from currently in-force permits.
- SRF and WTF Investment Allocations: These were provided by Mr. Sheehan and were used to project anticipated SRF and WTF investment revenues based on the allocation of funds to money market, short term bonds, and IMB fund.

Overall Methodology

Loss Projections

Losses were projected using two models: a traditional deterministic model and a stochastic generalized linear model, described in greater detail below.

Based on the results of these methods, we selected anticipated payment amounts in each future fiscal year. A three-year delay was added to these payment patterns to account for the delay between a permit revocation and the commencement of reclamation activities at the site.

Current cost estimates on active reclamation activities were adjusted for historical variances between cost estimates and the final costs. These costs were then spread out over time, assuming 50% of costs will be incurred in the year that work is scheduled to commence and 50% of costs will be incurred in the following year for land reclamation and water capital costs. Water operations & maintenance costs were projected to continue each year according to current estimated annual costs subject to an annual attenuation factor of 98% starting in 2033. This is due to the fact that annual O&M costs associated with currently active reclamations are projected to show modest declines after 10 years.

All costs are then adjusted to nominal dollars using an inflation factor of 2.5%.

Deterministic Loss Model

The traditional deterministic model projects anticipated bond forfeiture and permit release rates based on historical data triangles. Permits are arranged into cohorts by year of permit issuance based on the assumption that permit releases and bond forfeitures vary based on the age of permit. From these data triangles, overall release and forfeiture rates are selected for each age of permit, then adjusted to reflect anticipated differences in rates for permits based on current status (active, inactive, or phased release). These release and forfeiture rates are applied to currently open permits, separately for surface, underground, and other mine types and separately by permit status types. A final adjustment is made based on bond size, whereby

permits backed by smaller bonds (less than $500,000) are anticipated to be forfeited at a rate that is higher than permits backed by large bonds (greater than $500,000.)

These adjusted forfeiture and release rates are applied to currently open permits or bonded acres to determine the number of permits and acres expected to be released or forfeited each year in the future. We then apply anticipated average costs per forfeited acre to determine future costs by year for the anticipated land reclamation costs, water capital costs, and water operations & maintenance costs.

Stochastic Loss Model

The stochastic model uses advanced statistical techniques to project future anticipated forfeiture and release rates.

The stochastic model is formally based on a kind of generalized linear model, specifically a multinomial logistic regression model. The model uses historical data about forfeited and released bonds to predict the probability that open permits will experience forfeiture or release each year in the future. In addition, the stochastic model considers the parent companies of each permit and simulates bankruptcies from parent companies. When a parent company experiences bankruptcy, we project that the probability of forfeiture for the company's permits is increased by 30% for the year following. This is based on the understanding that although parent company bankruptcies can lead to forfeitures, the permits are often sold as assets to other companies as a way of preventing further forfeitures.

Technical details of the stochastic model are provided as **Appendix B** of the report.

Comparison of Deterministic and Stochastic Models

The deterministic and stochastic loss models have unique advantages and disadvantages that we considered carefully as part of our projections.

The deterministic model has the advantage that patterns of releases and forfeitures can be easily visualized. As a result, it is possible to make selections of anticipated release and forfeiture rates that explicitly anticipate recent or future changes in rates that could affect loss projections. By comparison, the stochastic model is less intuitive, and it can be challenging to make manual adjustments to fitted model results.

However, there are several drawbacks to the deterministic model that prompted the development of the stochastic model. First, the method assumes that future forfeitures and releases are roughly statistically independent. This assumption may be incorrect. Recent years have seen increasing consolidation in coal industry. As a result, permits are controlled by a smaller set of companies. For this reason, a single bankruptcy could lead to a large number of simultaneous forfeitures. This key issue was accounted for explicitly in the stochastic model.

Relatedly, the deterministic model makes a simplifying assumption about the number of bonds that will be forfeited or released in a year. For example, for a given age, the deterministic model may project that 0.93% of a particular kind of bond will be forfeited. Realistically, this means that a given bond will be forfeited with probability 0.93% or not forfeited with probability 99.07%. However, the deterministic model projects that 0.93% of all bonds will be forfeited. That is, for a given bond of 100 acres, the deterministic model might project that 0.93 acres will be forfeited in that year, where in actuality either 0 acres or 100 acres will be forfeited. This assumption may result in excessive confidence about the accuracy of the central estimate, particularly with respect to the timing and amount of cash flows. The stochastic model, by comparison, simulates individual permit behavior directly and thereby avoids using this assumption.

A final advantage of the stochastic model is that the use of a statistical framework enables the use of model validation tools that are not generally available for traditional models. This makes it possible to directly assess the extent to which different assumptions impact model predictive performance and deliver a model that is optimized to provide the most accurate predictions possible. In the deterministic model, predictions are assumed to be accurate, and model

validation is, at best, implicit in the extent to which forfeiture or release rates are selected to mirror or diverge from historical rates.

Revenue Projections

Anticipated coal tonnage fees were modeled by considering the anticipated change in Appalachian coal production per year from the consensus coal forecast as well as the effect of the "runoff" of permits. The runoff of permits is comprised of two separate factors:

1. A factor representing the reduction in number of active permits among the current cohort of open permits. This factor was projected as part of the loss models.
2. A factor representing the reduced coal production over time among the permits that remain open. This factor was determined judgmentally based on discussions with the Board and based on analysis provided by John Morgan, as discussed above.

With respect to the second point, we assumed the following rates of decline in coal production:

	Northern Mines	Southern Mines
Underground Mines	2.5%	5.0%
Surface Mines	25.0%	10.0%

Bond forfeitures revenues were determined based on the loss models. The deterministic loss model tracked the anticipated bond dollars forfeited in each period. The stochastic loss model considered the bond dollars forfeited across different simulated scenarios. These projections were combined to select a central estimate of bond forfeiture revenues.

Civil penalties were anticipated to decline in a manner commensurate with the decline in production on the current cohort of permits.

Investment returns were projected based on historical average returns. Short term bond fund and money market fund yields were projected by assuming that returns would drift over time from current values in the direction of historical averages. IMB yields were determined based on a review of historical IMB yields, capping returns at 5.0%. Although IMB yields continue to be very strong, this cap at 5.0% represents a departure from previous analyses which capped

yields at 5.5%; this change was taken for the sake of conservatism given the current uncertain interest rate environment.

Administrative Expense Calculations

Historical administrative expenses were provided to us for the years 2006 through June 30, 2023. Administrative expenses are defined as the sum of employee benefits, contractual obligations, personnel services, and other unclassified expenses.

Administrative expenses associated with the current cohort of permits were projected assuming 3% inflation each year and discounted based on the projected number of remaining permits in force from the cohort of open permits as of June 30, 2023.

Appendix B: Technical Details of the Stochastic Loss Model

Data Pre-Processing

The model was fitted on closed permits. However, the permit database only reflects the current status of the permits and the date that this status was set. Therefore, to determine the probability that a permit stays open in a given year, it was necessary to reconstruct historical permit data reflecting the fact that a permit with certain attributes was open in a given year.

For example, if a permit was issued in 1990 and released in 2000, the permit database reflects a single entry of "released" with a status year of 2000. However, inherent in that entry is an implied 10 years in which the permit had "open" status (during 1990, 1991, … 1999).

Model Form

The stochastic loss model is a multinomial logistic model with four outcomes: "Open," "Forfeited," "Release," and "Terminated." It predicts, based on a linear predictor, the log-odds of each outcome. The model was fitted using a neural network as part of the "nnet" package in R.

The linear predictor of the model is of the following form:

$$Permit\ Type \times NS \times Permits \times Permit\ Years \times Spline(Age*, 3) + Spline(Log(Cohort\ Acres), 3) + Spline(Issue\ Year, 5) + Poly(Age, 2)$$

Where the variables used are described as follows:

Variable	Description
Permit Type	Notes whether a permit is a surface mine, underground mine, prospect, or other
NS	Notes whether a mine is in a northern or southern county
Permits	Counts the number of permits held by the permittee
Permit Years	Counts the sum of the ages of all permits held by permittee
Cohort Acres	Sum of acres held by all permits issued in the same year as a given permit
Age	The length of time that a permit has been in force
Age*	Age, subject to a maximum value of 3
Issue Year	The year that a permit was issued

Spline(Variable, N)	A "beta spline" function of a given variable with N-1 knots. This is a piecewise function of 3rd degree polynomials with N different "pieces."
Poly(Variable, N)	An N-degree polynomial function of the variable

Beta splines were used after initial testing revealed that high-order polynomials produced superior fit (as measured by the AIC and by cross entropy error, discussed below) but failed to provide useful results when extrapolating beyond the training dataset. We determined that this was due to the inherent instability of high-order polynomials. We determined that spline functions produced similarly good fit over the training data and test set but generalized more robustly over the set of open permits.

Compared to the model form employed in the 2021 actuarial reserve study, this model has one adjustment, which is that the spline of permit age was interacted with Permit Type, NS, Permits, and Permit Years, whereas in the previous analysis it was not. This means that in the present analysis, the impact of permit age on the risk of forfeiture depends on the type of permit, whether the permit is in the northern or southern part of the state, and the number and total overall age of permits held by the permittee, whereas in the previous analysis the age of a permit was a separate variable that did not change dependent on these factors.

Variable Selection and Model Validation

The closed permits were split randomly into 80% training data and 20% test data. After the model form was determined, the model was re-fit on the entire dataset. Model predictions were carried out on the set of open permits.

Variables tested included size of bonds, specific county, permit status, specific permit type, and bonded acres. These variables were generally rejected either because of missing data or because they resulted in over-fitting the model. The same is true of many variable interactions that were tested.

Variables were selected based on the extent to which they improved the Akaike Information Criterion (AIC) of the model over the full training data or the extent to which they improved the

cross-entropy error in the test dataset. This is a measure of the degree to which the model properly categorizes permits as being open, forfeited, released, or terminated.

The model was additionally validated using plots of actual and fitted permit forfeitures and by reviewing model statistics such as t-statistics.

Initial tests of the model included the "Status Year" variable, indicating the latest year when the status of the permit was updated. This variable significantly improves the AIC and cross-entropy error when using a random sample of data, but out-of-time samples perform very poorly. This seems to be the result of the historical patterns in permit forfeiture, which causes the Status Year variable to generate significant over-fitting. For this reason, Status Year was excluded as a variable in this study.

Simulation

The final simulation was carried out in two steps. First, the baseline "status probabilities" (i.e., the probability that a permit remains open, is forfeited, etc.) were determined for each open permit for each of the 20 years in the future. Then, for each of 5,000 simulations, we carried out the following procedure:

1. Simulate whether each of the ultimate parent companies goes bankrupt in a given year using a Bernoulli probability distribution with probability 0.5%. This probability is based on default probability for high-grade credit ratings from major credit rating agencies.
2. Augment the baseline status probabilities with the simulated bankruptcies by adding 30% to the unnormalized log-odds of a permit being forfeited. This means that if a permit previously had a 10% probability of being forfeited, following the bankruptcy it would have a (10% + 30%) / 130% = 30.8% probability of being forfeited. The 30% probability was based on discussion with the Board and judgment.
3. For each year in the future, the status of each permit was simulated until the permit status was no longer "open."
4. The results of this simulation were stored, and then the process was repeated for the next simulation, starting at step 1.

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Executive Summary

	(1)	(2)	(3)	(4)	(5)
	Undiscounted Liabilities Arising From…				
Expense Category	Current Forfeitures	Future Forfeitures	**Total Liability**	Previous Study	Difference
Land Capital	28,294,342	91,970,150	**120,264,492**	99,746,231	20,518,261
Water Capital	44,313,589	88,016,419	**132,330,008**	225,077,369	(92,747,361)
Ongoing Water Treatment	122,414,879	23,988,658	**146,403,536**	180,831,780	(34,428,244)
Administration			**63,308,707**	59,166,576	4,142,131
Total	195,022,809	203,975,226	**462,306,742**	564,821,955	(102,515,213)

Notes:

Col (1) - (2) from Exhibits E-6 to E-8, Cols (6) and (7)
Col (3) Administration Expense from Exhibit E-9, Col (3)
Col (4) from Prior Study
Col (5) = (3) - (4)

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Financial Projection

Fiscal Year	Expenditures					Revenues						Beginning Balance		WTF to SRF	Ending Balance	
Ending 6/30	Land	Water Capital	Water Op/Maint	Admin	Total	SRF Coal Fees	WTF Coal Fees	Bond Forfeitures	Civil Penalties	SRF Investments	WTF Investments	SRF	WTF	Transfers	SRF	WTF
Prior															12,934,042	154,739,346
2024	12,124,720	18,869,388	4,915,462	3,706,097	39,615,668	9,596,777	11,159,043	3,161,484	764,500	325,397	7,596,594	12,934,042	154,739,346	22,833,468	10,000,000	150,661,516
2025	14,082,297	19,341,123	5,038,349	3,723,169	42,184,937	8,930,268	10,384,033	3,059,556	711,404	182,927	7,348,013	10,000,000	150,661,516	29,300,781	10,000,000	139,092,781
2026	1,695,820	508,171	5,211,738	3,630,603	11,046,333	8,448,464	9,823,796	2,949,822	673,023	145,278	6,756,931	10,000,000	139,092,781	-	11,170,253	155,673,508
2027	4,510,422	7,357,901	5,558,472	3,525,595	20,952,390	8,053,658	9,364,718	2,829,516	641,571	162,279	7,562,400	11,170,253	155,673,508	8,095,112	10,000,000	164,505,514
2028	8,719,174	10,762,468	5,897,724	3,434,747	28,814,113	7,450,952	8,663,898	2,705,550	593,559	145,278	7,991,446	10,000,000	164,505,514	17,918,775	10,000,000	163,242,083
2029	7,912,975	7,419,231	6,220,217	3,355,268	24,907,691	6,882,515	8,002,924	2,582,331	548,276	145,278	7,930,070	10,000,000	163,242,083	14,749,292	10,000,000	164,425,786
2030	7,223,556	6,943,199	6,535,938	3,284,762	23,987,455	6,522,442	7,584,234	2,461,985	519,592	145,278	7,987,573	10,000,000	164,425,786	14,338,160	10,000,000	165,659,433
2031	9,883,723	9,492,164	7,291,969	3,219,746	29,887,602	6,185,587	7,192,543	2,343,591	492,757	145,278	8,047,502	10,000,000	165,659,433	20,720,389	10,000,000	160,179,089
2032	5,994,282	5,747,198	7,211,212	3,162,272	22,114,964	5,887,104	6,845,470	2,230,714	468,979	145,278	7,781,274	10,000,000	160,179,089	13,382,890	10,000,000	161,422,944
2033	5,725,668	5,480,404	7,509,791	3,110,119	21,825,983	5,590,388	6,500,451	2,121,507	445,342	145,278	7,841,699	10,000,000	161,422,944	13,523,468	10,000,000	162,241,626
2034	5,462,654	5,220,243	7,809,220	3,063,041	21,555,157	5,295,969	6,158,103	2,016,801	421,888	145,278	7,881,470	10,000,000	162,241,626	13,675,221	10,000,000	162,605,978
2035	5,133,972	4,901,180	7,974,331	3,021,669	21,031,153	4,974,067	5,783,799	1,917,336	396,245	145,278	7,899,169	10,000,000	162,605,978	13,598,227	10,000,000	162,690,720
2036	4,898,876	4,671,168	8,136,659	2,981,287	20,687,990	4,657,657	5,415,880	1,821,293	371,039	145,278	7,903,286	10,000,000	162,690,720	13,692,724	10,000,000	162,317,162
2037	4,521,689	4,308,849	8,291,843	2,947,056	20,069,436	4,444,730	5,168,291	1,729,694	354,077	145,278	7,885,139	10,000,000	162,317,162	13,395,658	10,000,000	161,974,935
2038	4,303,485	4,098,321	8,444,092	2,915,428	19,761,325	4,290,722	4,989,212	1,641,935	341,808	145,278	7,868,514	10,000,000	161,974,935	13,341,582	10,000,000	161,491,079
2039	4,025,237	3,832,345	8,591,214	2,887,288	19,336,085	4,047,081	4,705,908	1,557,794	322,399	145,278	7,845,009	10,000,000	161,491,079	13,263,532	10,000,000	160,778,464
2040	3,767,358	3,587,003	8,733,842	2,863,605	18,951,808	3,898,645	4,533,308	1,477,642	310,574	145,278	7,810,391	10,000,000	160,778,464	13,119,669	10,000,000	160,002,494
2041	3,656,011	3,480,433	8,874,796	2,842,007	18,853,246	3,679,306	4,278,263	1,403,353	293,101	145,278	7,772,696	10,000,000	160,002,494	13,332,207	10,000,000	158,721,246
2042	3,408,157	3,246,318	9,011,415	2,824,688	18,490,579	3,530,300	4,105,000	1,333,199	281,231	145,278	7,710,454	10,000,000	158,721,246	13,200,570	10,000,000	157,336,131
2043	3,214,415	3,062,900	9,145,254	2,810,258	18,232,826	3,383,133	3,933,876	1,268,938	269,508	145,278	7,643,168	10,000,000	157,336,131	13,165,970	10,000,000	155,747,204

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Coal Tonnage Fees and Civil Penalties Projections

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Coal Production in Million Tons					% Coal Production From In-Force Permits				Total				
Fiscal Year	Northern		Southern			Northern		Southern		In-Force	Coal Tonnage Fees from In-Force Permits			Civil
Ending 6/30	Surface	Underground	Surface	Underground	Total	Surface	Underground	Surface	Underground	Production	SRF	WTF	Total	Penalties
2010	4.0	37.3	46.7	47.2	135.2	100%	100%	100%	100%	135.2	16,639,204	1,924,569	18,563,773	688,062
2011	3.3	38.6	48.0	44.8	134.7	100%	100%	100%	100%	134.7	18,168,515	2,100,436	20,268,951	805,018
2012	2.0	39.4	37.9	41.0	120.4	100%	100%	100%	100%	120.4	16,876,736	1,963,409	18,840,145	940,571
2013	1.5	40.9	32.4	37.9	112.8	100%	100%	100%	100%	112.8	15,277,933	14,605,229	29,883,163	677,771
2014	1.3	47.4	29.1	34.0	111.9	100%	100%	100%	100%	111.9	13,949,645	16,210,221	30,159,866	734,975
2015	0.9	46.9	19.4	28.4	95.6	100%	100%	100%	100%	95.6	14,936,957	17,369,799	32,306,756	2,551,755
2016	0.2	43.3	15.5	20.8	79.8	100%	100%	100%	100%	79.8	10,774,387	12,530,157	23,304,544	612,182
2017	0.1	46.6	20.1	25.9	92.8	100%	100%	100%	100%	92.8	11,174,041	12,994,938	24,168,979	822,617
2018	0.6	45.5	22.5	26.7	95.4	100%	100%	100%	100%	95.4	11,831,011	13,758,966	25,589,977	716,346
2019	0.7	46.3	22.3	23.9	93.3	100%	100%	100%	100%	93.3	12,138,331	14,116,367	26,254,698	976,343
2020	0.4	36.8	11.2	18.9	67.2	100%	100%	100%	100%	67.2	9,269,937	10,780,545	20,050,482	612,870
2021	0.4	44.1	12.9	21.1	78.5	100%	100%	100%	100%	78.5	8,771,920	10,166,395	18,938,315	877,641
2022	0.5	46.5	14.6	21.9	83.4	100%	100%	100%	100%	83.4	10,442,569	12,144,267	22,586,836	553,755
2023	0.5	41.2	16.4	21.6	79.7	100%	100%	100%	100%	79.7	11,060,255	12,862,610	23,922,866	763,239
2024	0.5	40.4	16.1	21.2	78.2	75%	98%	90%	95%	74.4	9,596,777	11,159,043	20,755,820	764,500
2025	0.5	39.5	15.8	20.7	76.4	56%	95%	81%	90%	69.2	8,930,268	10,384,033	19,314,301	711,404
2026	0.5	39.1	15.6	20.5	75.8	42%	93%	73%	86%	65.5	8,448,464	9,823,796	18,272,260	673,023
2027	0.5	39.1	15.6	20.5	75.7	32%	90%	66%	81%	62.4	8,053,658	9,364,718	17,418,376	641,571
2028	0.5	37.9	15.1	19.9	73.3	24%	88%	59%	77%	57.8	7,450,952	8,663,898	16,114,850	593,559
2029	0.5	36.6	14.6	19.2	70.8	18%	86%	53%	74%	53.4	6,882,515	8,002,924	14,885,439	548,276
2030	0.4	36.2	14.5	19.0	70.1	13%	84%	48%	70%	50.6	6,522,442	7,584,234	14,106,676	519,592
2031	0.4	35.8	14.3	18.8	69.4	10%	82%	43%	66%	48.0	6,185,587	7,192,543	13,378,130	492,757
2032	0.4	35.6	14.2	18.7	68.9	8%	80%	39%	63%	45.6	5,887,104	6,845,470	12,732,573	468,979
2033	0.4	35.2	14.1	18.5	68.2	6%	78%	35%	60%	43.3	5,590,388	6,500,451	12,090,839	445,342
2034	0.4	34.8	13.9	18.2	67.3	4%	76%	31%	57%	41.1	5,295,969	6,158,103	11,454,072	421,888
2035	0.4	34.0	13.6	17.8	65.8	3%	74%	28%	54%	38.6	4,974,067	5,783,799	10,757,866	396,245
2036	0.4	33.1	13.2	17.4	64.1	2%	72%	25%	51%	36.1	4,657,657	5,415,880	10,073,537	371,039
2037	0.4	32.8	13.1	17.2	63.6	2%	70%	23%	49%	34.5	4,444,730	5,168,291	9,613,022	354,077
2038	0.4	33.0	13.2	17.3	63.8	1%	68%	21%	46%	33.3	4,290,722	4,989,212	9,279,934	341,808
2039	0.4	32.3	12.9	16.9	62.5	1%	67%	19%	44%	31.4	4,047,081	4,705,908	8,752,990	322,399
2040	0.4	32.3	12.9	16.9	62.5	1%	65%	17%	42%	30.2	3,898,645	4,533,308	8,431,953	310,574
2041	0.4	31.6	12.6	16.6	61.2	1%	63%	15%	40%	28.5	3,679,306	4,278,263	7,957,569	293,101
2042	0.4	31.5	12.6	16.5	60.9	0%	62%	14%	38%	27.4	3,530,300	4,105,000	7,635,301	281,231
2043	0.4	31.2	12.5	16.4	60.5	0%	60%	12%	36%	26.2	3,383,133	3,933,876	7,317,009	269,508

Notes:
Cols (1) - (4) for 2010 - 2022 from USEIA; 2023 - 2043 based on Col (5) allocated out by mine and location type
Col (5) for 2010 - 2022 from USEIA; 2023 - 2043 from 2023 Consensus Coal Forecast
Col (6) - (7) from Exhibit E-70, Cols (6) and (7)
Cols (6) through (9) based on decline rates of 25%, 2.5%, 10%, and 5%, respectively; based on analysis provided by John Morgan
Col (10) = Sum Product of Cols (1) - (4) and Cols (6) - (9)
Col (11) = (10) × 1,000,000 × $0.129
Col (12) = (10) × 1,000,000 × $0.150
Col (13) = (11) + (12)
Col (14) from client data for 2023 and prior; 2024 and subsequent = average of 2010 - 2023 trended out based on Col (13)

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Coal Tonnage Fees Detail

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Coal Tonnage Fees from Permits In Force									Total	New Permit
Fiscal Year	As of June 30, 2021			Total Coal Tonnage Fees			Coal Tonnage Fees from New Permits			Civil	Civil
Ending 6/30	SRF	WTF	Total	SRF	WTF	Total	SRF	WTF	Total	Penalties	Penalties
2010	16,639,204	1,924,569	18,563,773	16,639,204	1,924,569	18,563,773				688,062	
2011	18,168,515	2,100,436	20,268,951	18,168,515	2,100,436	20,268,951				805,018	
2012	16,876,736	1,963,409	18,840,145	16,876,736	1,963,409	18,840,145				940,571	
2013	15,277,933	14,605,229	29,883,163	15,277,933	14,605,229	29,883,163				677,771	
2014	13,949,645	16,210,221	30,159,866	13,949,645	16,210,221	30,159,866				734,975	
2015	14,936,957	17,369,799	32,306,756	14,936,957	17,369,799	32,306,756				2,551,755	
2016	10,774,387	12,530,157	23,304,544	10,774,387	12,530,157	23,304,544				612,182	
2017	11,174,041	12,994,938	24,168,979	11,174,041	12,994,938	24,168,979				822,617	
2018	11,831,011	13,758,966	25,589,977	11,831,011	13,758,966	25,589,977				716,346	
2019	12,138,331	14,116,367	26,254,698	12,138,331	14,116,367	26,254,698				976,343	
2020	9,269,937	10,780,545	20,050,482	9,269,937	10,780,545	20,050,482				612,870	
2021	8,771,920	10,166,395	18,938,315	8,771,920	10,166,395	18,938,315				877,641	
2022	10,442,569	12,144,267	22,586,836	10,442,569	12,144,267	22,586,836				553,755	
2023	11,060,255	12,862,610	23,922,866	11,060,255	12,862,610	23,922,866				763,239	
2024	9,596,777	11,159,043	20,755,820	10,087,800	11,730,000	21,817,800	491,023	570,957	1,061,980	803,616	39,116
2025	8,930,268	10,384,033	19,314,301	9,855,600	11,460,000	21,315,600	925,332	1,075,967	2,001,299	785,118	73,714
2026	8,448,464	9,823,796	18,272,260	9,778,200	11,370,000	21,148,200	1,329,736	1,546,204	2,875,940	778,952	105,930
2027	8,053,658	9,364,718	17,418,376	9,765,300	11,355,000	21,120,300	1,711,642	1,990,282	3,701,924	777,924	136,353
2028	7,450,952	8,663,898	16,114,850	9,455,700	10,995,000	20,450,700	2,004,748	2,331,102	4,335,850	753,261	159,702
2029	6,882,515	8,002,924	14,885,439	9,133,200	10,620,000	19,753,200	2,250,685	2,617,076	4,867,761	727,570	179,294
2030	6,522,442	7,584,234	14,106,676	9,042,900	10,515,000	19,557,900	2,520,458	2,930,766	5,451,224	720,377	200,785
2031	6,185,587	7,192,543	13,378,130	8,952,600	10,410,000	19,362,600	2,767,013	3,217,457	5,984,470	713,183	220,426
2032	5,887,104	6,845,470	12,732,573	8,888,100	10,335,000	19,223,100	3,000,996	3,489,530	6,490,527	708,045	239,066
2033	5,590,388	6,500,451	12,090,839	8,797,800	10,230,000	19,027,800	3,207,412	3,729,549	6,936,961	700,851	255,509
2034	5,295,969	6,158,103	11,454,072	8,681,700	10,095,000	18,776,700	3,385,731	3,936,897	7,322,628	691,603	269,715
2035	4,974,067	5,783,799	10,757,866	8,488,200	9,870,000	18,358,200	3,514,133	4,086,201	7,600,334	676,188	279,943
2036	4,657,657	5,415,880	10,073,537	8,268,900	9,615,000	17,883,900	3,611,243	4,199,120	7,810,363	658,718	287,679
2037	4,444,730	5,168,291	9,613,022	8,204,400	9,540,000	17,744,400	3,759,670	4,371,709	8,131,378	653,580	299,503
2038	4,290,722	4,989,212	9,279,934	8,230,200	9,570,000	17,800,200	3,939,478	4,580,788	8,520,266	655,635	313,827
2039	4,047,081	4,705,908	8,752,990	8,062,500	9,375,000	17,437,500	4,015,419	4,669,092	8,684,510	642,276	319,877
2040	3,898,645	4,533,308	8,431,953	8,062,500	9,375,000	17,437,500	4,163,855	4,841,692	9,005,547	642,276	331,701
2041	3,679,306	4,278,263	7,957,569	7,894,800	9,180,000	17,074,800	4,215,494	4,901,737	9,117,231	628,916	335,815
2042	3,530,300	4,105,000	7,635,301	7,856,100	9,135,000	16,991,100	4,325,800	5,030,000	9,355,799	625,834	344,602
2043	3,383,133	3,933,876	7,317,009	7,804,500	9,075,000	16,879,500	4,421,367	5,141,124	9,562,491	621,723	352,215

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Investment Return Calculations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Investment Rates						
Fiscal Year	Money	Short Term	SRF	IMB	SRWTF	Discount Factor for	
Ending 6/30	Market	Bond	Blend	Yield	Selection	SRF	WTF
2023	3.7%	1.7%	2.5%	5.0%	4.9%	97.5%	95.3%
2024	2.4%	1.5%	1.8%	5.0%	4.9%	95.8%	90.9%
2025	1.4%	1.5%	1.5%	5.0%	4.9%	94.4%	86.7%
2026	1.4%	1.5%	1.5%	5.0%	4.9%	93.1%	82.7%
2027	1.4%	1.5%	1.5%	5.0%	4.9%	91.7%	78.8%
2028	1.4%	1.5%	1.5%	5.0%	4.9%	90.4%	75.2%
2029	1.4%	1.5%	1.5%	5.0%	4.9%	89.1%	71.7%
2030	1.4%	1.5%	1.5%	5.0%	4.9%	87.9%	68.4%
2031	1.4%	1.5%	1.5%	5.0%	4.9%	86.6%	65.2%
2032	1.4%	1.5%	1.5%	5.0%	4.9%	85.4%	62.2%
2033	1.4%	1.5%	1.5%	5.0%	4.9%	84.1%	59.3%
2034	1.4%	1.5%	1.5%	5.0%	4.9%	82.9%	56.6%
2035	1.4%	1.5%	1.5%	5.0%	4.9%	81.7%	53.9%
2036	1.4%	1.5%	1.5%	5.0%	4.9%	80.6%	51.4%
2037	1.4%	1.5%	1.5%	5.0%	4.9%	79.4%	49.1%
2038	1.4%	1.5%	1.5%	5.0%	4.9%	78.3%	46.8%
2039	1.4%	1.5%	1.5%	5.0%	4.9%	77.2%	44.6%
2040	1.4%	1.5%	1.5%	5.0%	4.9%	76.1%	42.5%
2041	1.4%	1.5%	1.5%	5.0%	4.9%	75.0%	40.6%
2042	1.4%	1.5%	1.5%	5.0%	4.9%	73.9%	38.7%
2043	1.4%	1.5%	1.5%	5.0%	4.9%	72.8%	36.9%

Notes:
Col (1) Based on average annual money market returns
Col (2) based on average annual change in returns, returning to long-run average over time
Col (3) = Col (1) × 39% + Col (2) × 61%; percents based on current allocations
Col (4) from West Virginia Investment Management Board 2023 Report, Returns Capped at 5%
Col (5) = Col (1) × 2% + Col (2) × 2% + Col (4) × 96%; percents based on current allocations
Col (6) = 1.0 / [1 + (3)] × Prior Year Discount
Col (7) = 1.0 / [1 + (5)] × Prior Year Discount

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Special Reclamation Fund
Payout of Land Liabilities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Unadjusted Costs			Inflated Cost at 2.50% Annual Inflation		
Fiscal Year Ending 6/30	Curr. Scheduled Liabilities	Payout Pattern	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total
Prior	18,059,858							
2024	5,892,032	50%	11,975,945	-	11,975,945	12,124,720	-	12,124,720
2025	3,188,601	50%	13,570,245	-	13,570,245	14,082,297	-	14,082,297
2026	-		1,594,301	-	1,594,301	1,695,820	-	1,695,820
2027	-		-	4,136,982	4,136,982	-	4,510,422	4,510,422
2028	346,007		173,003	7,629,213	7,802,216	193,336	8,525,839	8,719,174
2029	-		173,003	6,735,095	6,908,099	198,169	7,714,806	7,912,975
2030	-		-	6,152,419	6,152,419	-	7,223,556	7,223,556
2031			-	8,212,806	8,212,806	-	9,883,723	9,883,723
2032				4,859,419	4,859,419		5,994,282	5,994,282
2033				4,528,449	4,528,449		5,725,668	5,725,668
2034				4,215,053	4,215,053		5,462,654	5,462,654
2035				3,864,818	3,864,818		5,133,972	5,133,972
2036				3,597,892	3,597,892		4,898,876	4,898,876
2037				3,239,877	3,239,877		4,521,689	4,521,689
2038				3,008,321	3,008,321		4,303,485	4,303,485
2039				2,745,185	2,745,185		4,025,237	4,025,237
2040				2,506,646	2,506,646		3,767,358	3,767,358
2041				2,373,230	2,373,230		3,656,011	3,656,011
2042				2,158,381	2,158,381		3,408,157	3,408,157
2043				1,986,034	1,986,034		3,214,415	3,214,415
Total	27,486,497		27,486,497	71,949,820	99,436,318	28,294,342	91,970,150	120,264,492

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Trust Fund
Payout of Water Capital Liabilities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Unadjusted Costs			Inflated Cost at 2.50% Annual Inflation		
Fiscal Year Ending 6/30	Curr. Scheduled Liabilities	Payout Pattern	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total
Prior	22,975,146							
2024	14,300,560	50%	18,637,853	-	18,637,853	18,869,388	-	18,869,388
2025	-	50%	18,637,853	-	18,637,853	19,341,123	-	19,341,123
2026	955,499		477,750	-	477,750	508,171	-	508,171
2027	4,596,472		2,775,985	3,972,719	6,748,705	3,026,570	4,331,331	7,357,901
2028	-		2,298,236	7,332,389	9,630,625	2,568,337	8,194,131	10,762,468
2029	-		-	6,477,056	6,477,056	-	7,419,231	7,419,231
2030	-		-	5,913,635	5,913,635	-	6,943,199	6,943,199
2031				7,887,443	7,887,443	-	9,492,164	9,492,164
2032				4,659,113	4,659,113	-	5,747,198	5,747,198
2033				4,334,469	4,334,469	-	5,480,404	5,480,404
2034				4,028,006	4,028,006	-	5,220,243	5,220,243
2035				3,689,574	3,689,574	-	4,901,180	4,901,180
2036				3,430,656	3,430,656	-	4,671,168	4,671,168
2037				3,087,373	3,087,373	-	4,308,849	4,308,849
2038				2,864,903	2,864,903	-	4,098,321	4,098,321
2039				2,613,634	2,613,634	-	3,832,345	3,832,345
2040				2,386,646	2,386,646	-	3,587,003	3,587,003
2041				2,259,257	2,259,257	-	3,480,433	3,480,433
2042				2,055,889	2,055,889	-	3,246,318	3,246,318
2043				1,892,419	1,892,419	-	3,062,900	3,062,900
Total	42,827,677		42,827,677	68,885,181	111,712,858	44,313,589	88,016,419	132,330,008

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Trust Fund
Payout of Water Operations & Maintenance Liabilities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Unadjusted Costs			Inflated Cost at 2.50% Annual Inflation		
Fiscal Year Ending 6/30	Curr. Scheduled Liabilities	Payout Pattern	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total	Proj. Payout of Current Liabilities	Proj. Payout of Future Liabilities	Total
Prior	4,702,171							
2024	4,855,147	n/a	4,855,147	-	4,855,147	4,915,462	-	4,915,462
2025	4,855,147		4,855,147	-	4,855,147	5,038,349	-	5,038,349
2026	4,899,739		4,899,739	-	4,899,739	5,211,738	-	5,211,738
2027	4,998,988		4,998,988	99,271	5,098,259	5,450,240	108,232	5,558,472
2028	4,998,988		4,998,988	278,497	5,277,485	5,586,496	311,227	5,897,724
2029	4,998,988		4,998,988	431,318	5,430,306	5,726,159	494,058	6,220,217
2030	4,998,988		4,998,988	567,775	5,566,764	5,869,313	666,625	6,535,938
2031	4,998,988		4,998,988	1,060,219	6,059,208	6,016,046	1,275,924	7,291,969
2032	4,998,988		4,998,988	846,966	5,845,954	6,166,447	1,044,765	7,211,212
2033	4,998,988		4,998,988	940,529	5,939,517	6,320,608	1,189,183	7,509,791
2034	4,998,988		4,998,988	1,026,705	6,025,694	6,478,623	1,330,596	7,809,220
2035	4,899,009		4,899,009	1,104,011	6,003,020	6,507,777	1,466,554	7,974,331
2036	4,801,029		4,801,029	1,174,795	5,975,824	6,537,062	1,599,597	8,136,659
2037	4,705,008		4,705,008	1,236,256	5,941,264	6,566,479	1,725,364	8,291,843
2038	4,610,908		4,610,908	1,291,876	5,902,784	6,596,028	1,848,064	8,444,092
2039	4,518,690		4,518,690	1,340,460	5,859,150	6,625,710	1,965,504	8,591,214
2040	4,428,316		4,428,316	1,382,827	5,811,143	6,655,526	2,078,316	8,733,842
2041	4,339,750		4,339,750	1,421,156	5,760,905	6,685,476	2,189,320	8,874,796
2042	4,252,955		4,252,955	1,453,962	5,706,916	6,715,560	2,295,855	9,011,415
2043	4,167,895		4,167,895	1,482,520	5,650,415	6,745,780	2,399,473	9,145,254
Total	100,027,670		95,325,499	17,139,143	112,464,642	122,414,879	23,988,658	146,403,536

West Virginia Department of Environmental Protection Office of Special Reclamatio
Actuarial Reserve Study as of June 30, 2023
Administrative Expense Projection

Fiscal Year Ending 6/30	(1) Total Admin Expense	(2) Remaining Permits	(3) Admin Expense On In-Force Permits
2024	4,019,132	92%	3,706,097
2025	4,139,706	90%	3,723,169
2026	4,263,897	85%	3,630,603
2027	4,391,814	80%	3,525,595
2028	4,523,568	76%	3,434,747
2029	4,659,276	72%	3,355,268
2030	4,799,054	68%	3,284,762
2031	4,943,025	65%	3,219,746
2032	5,091,316	62%	3,162,272
2033	5,244,056	59%	3,110,119
2034	5,401,377	57%	3,063,041
2035	5,563,419	54%	3,021,669
2036	5,730,321	52%	2,981,287
2037	5,902,231	50%	2,947,056
2038	6,079,298	48%	2,915,428
2039	6,261,677	46%	2,887,288
2040	6,449,527	44%	2,863,605
2041	6,643,013	43%	2,842,007
2042	6,842,303	41%	2,824,688
2043	7,047,572	40%	2,810,258
Total	107,995,582		63,308,707

Notes: Col (1) from client data, trended at 3% per year.
Col (2) from Exhibit E-17, Col (5)
Col (3) = (1) × (2)

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Average Reclamation Expenses - Land

		Surface	Underground	Other
(1)	Total reclamation expenditure in 2023 dollars (i.e., inflated)	173,400,634	71,765,026	53,177,134
(2)	Total disturbed acreage	37,390	3,945	4,526
(3)	Average cost per disturbed acre in 2023 dollars	4,638	18,191	11,748
(4)	Percent of permitted acreage that is disturbed	69.71%	73.09%	79.23%
(5)	Cost per permitted acre in 2023 dollars	3,233	13,296	9,309
(6)	Selected cost per acre	3,235	13,295	9,310
	Previous Selection	2,685	11,610	8,785

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Average Reclamation Expenses - Water Capital

		Surface	Underground	Other
(1)	Total expenditure in 2023 Dollars (i.e., inflated)	137,600,932	25,567,512	74,450,874
(2)	Total disturbed acreage under permits with water issues	11,766	646	1,297
(3)	Average cost per disturbed acre in 2023 dollars	11,695	39,582	57,384
(4)	Percent of permitted acreage that is disturbed under permits with water	70.04%	84.18%	79.58%
(5)	Cost Per Permitted Acre in 2023 dollars	8,191	33,321	45,669
(6)	Percent of forfeited acres with water issues	31.32%	14.22%	28.54%
(7)	Cost Per Disturbed Acre in 2023 dollars with water issues	3,663	5,627	16,376
(8)	Cost Per Permitted Acre in 2023 dollars with water issues	2,566	4,737	13,033
(9)	Selected Cost Per Acre with water issues	3,030	5,165	13,035
	Previous Selection	3,490	5,595	8,145

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Average Reclamation Expenses - Water O&M

		Surface	Underground	Other
(1)	Total Annual Expenditure in Actual Dollars for Water Forfeited Permits	3,600,543	686,089	712,356
(2)	Total disturbed acreage under permits with water issues	11,766	646	1,297
(3)	Total cost per disturbed acre for water issue sites	306	1,062	549
(4)	Percent of permitted acreage that is disturbed under permits with water	70.04%	84.18%	79.58%
(5)	Valuation Cost Per Permitted Acre	214	894	437
(6)	Percent of forfeited acres with water issues	31.32%	14.22%	28.54%
(7)	Valuation Cost Per Disturbed Acre with water issues	96	151	157
(8)	Valuation Cost Per Permitted Acre with water issues	67	127	125
(9)	Selected Valuation Cost Per Acre with water issues	80	135	130
	Previous Selection	90	140	135

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Bond Size Adjustment Factor Calculation

Bond Category	Bond Value	(1) Previous Selected Factor	(2) 2015 Active + Inactive Permits	(3) 2015-23 Revoked Permits	(4) Forfeiture Probability	(5) Relativity	(6) 2023 Selected Factor
Small	Less than $100,000	1.25	978	23	2.35%	1.18	1.20
Medium	Between $100,000 and $500,000	0.55	447	5	1.12%	0.56	0.55
Large	Above $500,000	0.90	431	9	2.09%	1.05	0.95
Total			1,856	37	1.99%	1.00	

Notes:
Col (1) from previous analysis
Cols (2) and (3) from client data
Col (4) = (3) / (2)
Col (5) = (4) / (4 Total)
Col (6) selected based on previous and current relativities

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Release and Forfeiture Probability Relativities by Status

Status	(1) Total Permits 2015	(2) Total Forfeitures 2015-23	(3) Probability	(4) Relativity	(5) 2021 Selection	(6) Selected
Active	1,345	20	1.49%	0.75	0.60	0.70
Inactive	266	10	3.76%	1.90	1.35	1.60
Phased Release	258	7	2.71%	1.37	2.35	1.85
Overall	1,869	37	1.98%			

Status	Total Permits 2015	Total Releases 2015-23	Probability	Relativity	2021 Selection	Selected
Active	1,345	173	12.86%	0.85	0.80	0.85
Inactive	266	22	8.27%	0.55	0.50	0.50
Phased Release	258	87	33.72%	2.23	2.40	2.30
Overall	1,869	282	15.09%			

Notes:
Cols (1) and (2) from client data
Col (3) = (2) / (1)
Col (4) = (3) / (3 Total)
Col (5) from previous analysis
Col (6) selected based on previous and current relativities

Triangle Data on Number of Permits, Forfeitures, Releases, and Terminations By Permit Type and Issue Year

Surface
Total Permits

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	10	9	9	9	9	9	9	9	9	8	8	8	8	8	8	7	7	5	5
1969	11	11	11	10	10	10	10	10	10	10	10	10	10	9	8	7	7	5	5
1970	13	13	12	12	12	12	12	12	12	12	12	12	12	12	10	10	8	7	5
1971	20	20	19	19	19	19	19	18	18	18	18	18	18	18	14	13	11	7	7
1972	22	22	22	21	21	21	21	21	21	21	21	21	19	11	7	4	1	1	1
1973	22	22	22	22	22	22	22	22	22	22	22	19	16	11	10	10	8	7	6
1974	41	41	41	41	41	41	41	41	39	39	37	26	22	20	16	14	12	12	12
1975	103	103	103	103	103	101	100	98	95	89	67	47	38	30	25	24	22	20	16
1976	92	92	90	90	85	84	83	81	74	55	40	35	30	27	26	20	18	18	17
1977	118	116	114	107	106	105	104	96	76	54	45	35	32	27	25	22	21	18	17
1978	166	164	162	158	155	152	142	114	86	77	62	49	47	44	39	38	33	30	27
1979	81	81	80	78	77	73	63	52	44	42	40	36	36	31	29	24	19	17	15
1980	115	115	115	113	110	102	97	92	85	79	73	64	55	45	42	37	31	30	29
1981	164	164	161	152	145	138	129	125	117	110	106	99	90	84	75	71	58	52	46
1982	93	93	89	81	72	69	65	59	56	51	43	33	26	20	15	14	10	8	6
1983	190	188	180	157	147	133	125	113	105	93	72	63	54	49	43	40	34	28	24
1984	107	106	101	92	90	86	81	76	64	54	46	37	33	26	23	19	16	15	14
1985	133	128	121	120	118	116	112	104	93	81	68	60	46	38	31	27	25	25	24
1986	128	119	114	109	106	104	99	90	78	64	60	54	49	43	38	32	29	26	24
1987	140	138	131	127	124	115	103	92	81	69	58	53	45	35	29	22	20	19	19
1988	115	113	109	107	99	91	88	78	69	59	48	44	40	32	29	29	28	27	27
1989	134	125	123	120	115	110	103	97	86	74	62	52	47	40	37	35	33	31	28
1990	92	92	86	81	74	71	67	59	57	47	39	34	33	32	31	31	30	28	27
1991	74	72	69	67	66	65	64	56	50	42	35	31	31	29	27	25	23	19	19
1992	52	51	48	47	44	43	41	39	31	22	20	16	16	14	13	11	10	9	9
1993	59	58	52	49	49	48	45	42	37	32	29	27	26	24	20	19	16	16	16
1994	42	41	39	39	38	34	30	28	28	24	23	21	21	18	18	18	15	14	14
1995	40	40	40	39	39	37	34	30	28	28	26	25	24	23	23	22	22	21	20
1996	29	29	29	29	29	29	29	29	27	26	26	26	25	24	22	22	22	21	19
1997	47	45	44	44	42	42	42	40	38	37	36	36	34	31	30	29	28	27	27
1998	36	36	35	35	35	34	33	33	31	30	30	28	28	27	27	27	27	27	27
1999	17	17	14	14	14	12	12	11	11	10	10	9	8	7	7	7	7	7	7
2000	19	19	19	19	17	16	14	13	12	12	12	11	11	11	9	9	8	8	7
2001	26	26	26	26	26	26	26	25	25	25	25	25	25	25	24	24	24	24	24
2002	23	23	22	22	22	22	22	21	21	21	20	20	20	20	20	20	20	20	20
2003	29	29	29	28	28	27	25	24	24	23	22	22	22	22	22	22	22	22	22
2004	33	33	32	32	32	31	31	31	31	31	31	31	31	31	31	30	28	28	28
2005	19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	16	16
2006	16	16	16	15	15	15	15	15	15	14	13	13	13	13	13	13	13	13	
2007	31	31	31	31	30	30	30	30	28	26	26	26	25	25	25	25	25		
2008	24	24	24	24	24	24	24	24	23	22	21	21	18	18	18	18			
2009	25	25	25	25	25	25	25	24	24	24	23	22	21	21	21				
2010	15	15	15	15	15	14	14	14	14	14	14	14	13	13					
2011	21	21	21	21	21	21	21	21	21	21	20	20	20						
2012	26	26	26	25	24	24	24	24	24	24	23	23							
2013	25	25	24	23	23	23	23	23	23	23	23								
2014	22	22	22	22	22	22	22	22	22	22									
2015	16	16	15	15	15	15	15	15	15										
2016	11	11	11	11	11	11	11	11											
2017	6	6	6	6	6	5	5												
2018	9	9	9	9	9	9													
2019	9	9	9	9	9														
2020	11	11	11	11															
2021	7	7	7																
2022	15	15																	
2023	15																		

Surface
Total Permits

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	3	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
1969	4	4	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	4	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	6	4	4	4	3	3	3	3	3	2	1	1	1	1	1	1	1	1	0	0
1972	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1973	5	5	3	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
1974	12	10	10	10	7	5	4	3	3	2	2	2	2	2	2	2	2	2	2	2
1975	15	11	9	8	6	6	5	4	4	4	4	4	4	4	4	4	3	2	2	2
1976	15	15	14	14	13	11	10	10	10	10	10	10	10	10	9	9	8	8	8	7
1977	14	14	13	12	12	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
1978	22	19	17	17	16	15	13	13	11	11	11	11	9	8	8	8	8	8	8	8
1979	13	11	11	11	10	8	8	7	6	6	5	5	5	5	5	5	5	5	4	4
1980	28	24	19	18	15	14	12	12	11	11	7	7	7	7	7	7	7	6	6	6
1981	42	38	37	35	33	31	29	28	28	26	25	23	22	22	21	20	20	19	18	18
1982	5	5	5	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	2
1983	22	20	16	16	15	15	14	13	12	11	11	11	9	9	9	9	9	9	8	7
1984	14	13	12	12	11	11	10	9	9	8	8	8	8	7	7	6	6	5	4	4
1985	18	16	16	16	13	10	10	10	10	8	8	8	7	7	7	7	7	7	7	7
1986	23	22	22	21	18	17	17	15	15	15	14	14	14	14	14	14	13	13	13	
1987	19	18	18	16	13	12	12	12	12	12	12	11	10	9	9	9	9	9		
1988	26	24	23	20	18	16	15	15	15	15	15	15	14	14	14	14	14			
1989	25	22	21	21	20	19	17	17	17	15	15	15	15	15	14	14				
1990	27	26	24	22	21	19	19	19	18	17	17	17	16	16	16					
1991	19	16	15	15	15	15	14	14	14	14	14	14	14	14						
1992	9	9	9	9	9	8	8	7	7	6	6	6	6							
1993	16	14	13	13	13	13	13	13	13	13	13	13								
1994	14	14	14	13	13	13	13	13	13	13	12									
1995	20	20	19	19	19	19	19	19	18	17										
1996	19	19	18	18	18	18	17	17	16											
1997	27	26	26	26	26	26	26	26												
1998	26	25	24	24	24	24	24													
1999	7	7	7	6	6	6														
2000	7	7	7	7	7															
2001	24	24	24	24																
2002	19	19	19																	
2003	21	21																		
2004	28																			
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Surface
Total Permits

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	1	1	1	1	1	1	1	1	1	1	1	1	1							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	2	2	2	2	2	2	2	2	2	2	2									
1975	2	2	2	2	2	2	2	2	2	2										
1976	7	7	6	6	6	6	6	6	6											
1977	8	8	8	8	8	8	8	8												
1978	7	7	7	6	6	6	6													
1979	4	4	4	4	4	4														
1980	6	5	3	2	2															
1981	18	18	17	15																
1982	2	2	2																	
1983	7	7																		
1984	4																			
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2023																				

Surface
Total Releases

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	0
1969	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
1970	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	2
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	2	0
1972	0	0	0	1	0	0	0	0	0	0	0	0	1	8	4	3	3	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	3	3	5	1	0	2	0	1
1974	0	0	0	0	0	0	0	0	0	0	1	11	4	2	4	2	1	0	0
1975	0	0	0	0	0	0	0	1	0	4	22	17	8	7	4	1	2	2	4
1976	0	0	0	0	0	0	0	1	6	18	13	5	4	2	1	6	1	0	1
1977	0	0	0	1	0	0	0	8	20	20	8	10	3	3	2	3	1	2	1
1978	0	0	0	0	0	0	6	23	22	7	14	12	1	2	3	1	4	2	2
1979	0	0	0	0	0	3	9	9	7	2	2	3	0	4	2	3	3	1	2
1980	0	0	0	0	3	6	4	5	7	6	5	6	5	8	2	3	6	1	1
1981	0	0	0	7	4	6	9	4	6	6	4	5	7	4	6	1	11	6	6
1982	0	0	3	6	7	3	3	6	3	5	4	7	5	6	4	0	4	2	1
1983	0	1	6	18	7	13	4	10	8	8	14	4	7	2	4	3	6	4	1
1984	0	1	0	4	1	3	3	5	9	5	7	8	4	7	2	4	0	1	1
1985	0	4	4	1	0	1	3	4	8	9	11	7	10	8	7	4	2	0	1
1986	1	7	2	2	0	1	3	3	6	9	4	5	4	4	3	5	3	2	2
1987	1	2	3	2	1	2	7	5	6	11	10	5	7	6	5	7	2	0	0
1988	1	2	0	1	3	3	0	6	8	7	9	4	4	7	2	0	0	1	0
1989	0	3	1	1	1	1	3	5	11	8	12	5	4	7	3	1	2	2	3
1990	0	0	0	0	4	1	3	6	2	10	7	3	1	1	0	0	1	2	1
1991	0	0	1	0	0	0	1	8	5	8	7	4	0	2	1	2	1	3	0
1992	0	0	0	0	3	1	1	1	8	7	2	4	0	2	1	2	1	0	0
1993	0	1	1	2	0	1	1	3	5	4	3	1	1	2	4	0	1	0	0
1994	0	1	1	0	0	4	1	1	0	4	1	2	0	3	0	0	3	1	0
1995	0	0	0	1	0	1	3	4	2	0	2	1	1	0	0	1	0	1	1
1996	0	0	0	0	0	0	0	0	2	1	0	0	1	0	2	0	0	1	1
1997	0	2	1	0	2	0	0	2	2	1	1	0	1	2	1	1	1	0	0
1998	0	0	0	0	0	0	1	0	2	1	0	2	0	1	0	0	0	0	0
1999	0	0	3	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0
2000	0	0	0	0	1	0	0	1	0	0	0	1	0	0	1	0	1	0	1
2001	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0
2004	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0
2005	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
2006	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0		
2008	0	0	0	0	0	0	0	0	0	1	1	0	3	0	0	0			
2009	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0				
2010	0	0	0	0	0	0	0	0	0	0	0	0	1	0					
2011	0	0	0	0	0	0	0	0	0	0	1	0	0						
2012	0	0	0	0	1	0	0	0	0	0	0	0							
2013	0	0	0	1	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	1	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Surface
Total Releases

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	1	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	1	0	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1974	0	2	0	0	3	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0
1975	1	4	2	1	2	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0
1976	2	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1
1977	3	0	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	5	3	2	0	1	1	2	0	1	0	0	0	1	1	0	0	0	0	0	0
1979	2	2	0	0	1	2	0	1	1	0	1	0	0	0	0	0	0	0	1	0
1980	1	4	3	1	3	1	2	0	1	0	1	0	0	0	0	0	0	1	0	0
1981	3	2	1	2	2	2	2	1	0	0	1	1	1	0	1	1	0	1	1	0
1982	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1983	1	2	3	0	1	0	1	1	1	1	0	0	2	0	0	0	0	0	1	1
1984	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	1	0
1985	4	2	0	0	3	1	0	0	0	2	0	0	1	0	0	0	0	0	0	0
1986	1	0	0	1	0	1	0	2	0	0	1	0	0	0	0	0	0	0	0	
1987	0	1	0	1	2	1	0	0	0	0	0	1	1	1	0	0	0	0		
1988	1	1	0	3	1	2	1	0	0	0	0	0	1	0	0	0	0			
1989	2	2	1	0	0	0	2	0	0	2	0	0	0	0	1	0				
1990	0	1	2	2	1	2	0	0	1	1	0	0	1	0	0					
1991	0	3	1	0	0	0	1	0	0	0	0	0	0	0						
1992	0	0	0	0	0	1	0	1	0	1	0	0	0							
1993	0	2	1	0	0	0	0	0	0	0	0	0								
1994	0	0	0	1	0	0	0	0	0	0	1									
1995	0	0	0	0	0	0	0	0	1	0										
1996	0	0	1	0	0	0	1	0	1											
1997	0	1	0	0	0	0	0	0												
1998	1	1	1	0	0	0	0													
1999	0	0	0	1	0	0														
2000	0	0	0	0	0															
2001	0	0	0	0																
2002	0	0	0																	
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Surface
Total Releases

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	1	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	1	0	0	1	0	0	0													
1979	0	0	0	0	0	0														
1980	0	1	2	1	0															
1981	0	0	1	2																
1982	0	0	0																	
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2022																				
2023																				

Surface
Total Forfeitures

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
1974	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	1	0	0
1975	0	0	0	0	0	2	1	1	3	2	0	3	1	1	1	0	0	0	0
1976	0	0	2	0	5	1	1	1	1	1	2	0	1	1	0	0	1	0	0
1977	0	2	2	6	1	1	1	0	0	2	1	0	0	2	0	0	0	1	0
1978	0	2	2	4	3	3	4	5	6	2	1	1	1	1	2	0	1	1	1
1979	0	0	1	2	1	1	1	2	1	0	0	1	0	1	0	2	2	1	0
1980	0	0	0	2	0	2	1	0	0	0	1	3	4	2	1	2	0	0	0
1981	0	0	3	2	3	1	0	0	2	1	0	2	2	2	3	3	2	0	0
1982	0	0	1	2	2	0	1	0	0	0	4	3	2	0	1	1	0	0	1
1983	0	1	2	5	3	1	4	2	0	4	7	5	2	3	2	0	0	2	3
1984	0	0	5	5	1	1	2	0	3	5	1	1	0	0	1	0	3	0	0
1985	0	1	3	0	2	1	1	4	3	3	2	1	4	0	0	0	0	0	0
1986	0	2	3	3	3	1	2	6	6	5	0	1	1	2	2	1	0	1	0
1987	0	0	4	2	2	7	5	6	5	1	1	0	1	4	1	0	0	1	0
1988	0	0	4	1	5	5	3	4	1	3	2	0	0	1	1	0	1	0	0
1989	0	6	1	2	4	4	4	1	0	4	0	5	1	0	0	1	0	0	0
1990	0	0	6	5	3	2	1	2	0	0	1	2	0	0	1	0	0	0	0
1991	0	2	2	2	1	1	0	0	1	0	0	0	0	0	1	0	1	1	0
1992	0	1	3	1	0	0	1	1	0	2	0	0	0	0	0	0	0	1	0
1993	0	0	5	1	0	0	2	0	0	1	0	1	0	0	0	1	2	0	0
1994	0	0	1	0	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1997	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
1998	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	1	1	2	0	1	0	0	0	0	0	1	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
2007	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0		
2008	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0			
2009	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0				
2010	0	0	0	0	0	1	0	0	0	0	0	0	0	0					
2011	0	0	0	0	0	0	0	0	0	0	0	0	0						
2012	0	0	0	1	0	0	0	0	0	0	1	0							
2013	0	0	1	0	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	1	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Surface
Total Forfeitures

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
1981	1	2	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
1985	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
1987	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
1988	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0			
1989	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1992	0	0	0	0	0	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	0	0	0	0	0	0	0	0									
1995	0	0	1	0	0	0	0	0	0	1										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
1998	0	0	0	0	0	0	0													
1999	0	0	0	0	0	0														
2000	0	0	0	0	0															
2001	0	0	0	0																
2002	1	0	0																	
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2023																				

Surface
Total Forfeitures

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	0	0	0	0	0	0	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
1981	0	0	0	0																
1982	0	0	0																	
1983	0	0																		
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2023																				

Surface
Misc Terminations

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2011	0	0	0	0	0	0	0	0	0	0	0	0	0						
2012	0	0	0	0	0	0	0	0	0	0	0	0							
2013	0	0	0	0	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Surface
Misc Terminations

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1992	0	0	0	0	0	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	0	0	0	0	0	0	0	0									
1995	0	0	0	0	0	0	0	0	0	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
1998	0	0	0	0	0	0	0													
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2023																				

Surface
Misc Terminations

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	0	0	0	0	0	0	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
1981	0	0	0	0																
1982	0	0	0																	
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2022																				
2023																				

Surface
Percent Forfeited

Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	11.11%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	18.18%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.88%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	1.94%	0.99%	1.00%	3.06%	2.11%	0.00%	4.48%	2.13%	2.63%	3.33%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	2.17%	0.00%	5.56%	1.18%	1.19%	1.20%	1.23%	1.35%	3.64%	0.00%	2.86%	3.33%	0.00%	0.00%	5.00%	0.00%	0.00%
1977	0.00%	1.69%	1.72%	5.26%	0.93%	0.94%	0.95%	0.00%	0.00%	2.63%	1.85%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	4.76%	0.00%
1978	0.00%	1.20%	1.22%	2.47%	1.90%	1.94%	2.63%	3.52%	5.26%	2.33%	1.30%	1.61%	2.04%	2.13%	4.55%	0.00%	2.63%	3.03%	3.33%
1979	0.00%	0.00%	1.23%	2.50%	1.28%	1.30%	1.37%	3.17%	1.92%	0.00%	0.00%	2.50%	0.00%	2.78%	0.00%	6.90%	8.33%	5.26%	0.00%
1980	0.00%	0.00%	0.00%	1.74%	0.00%	1.82%	0.98%	0.00%	0.00%	0.00%	1.27%	4.11%	6.25%	3.64%	2.22%	4.76%	0.00%	0.00%	0.00%
1981	0.00%	0.00%	1.83%	1.24%	1.97%	0.69%	0.00%	0.00%	1.60%	0.85%	0.00%	1.89%	2.02%	2.22%	3.57%	4.00%	2.82%	0.00%	0.00%
1982	0.00%	0.00%	1.08%	2.25%	2.47%	0.00%	1.45%	0.00%	0.00%	0.00%	7.84%	6.98%	6.06%	0.00%	5.00%	6.67%	0.00%	0.00%	12.50%
1983	0.00%	0.53%	1.06%	2.78%	1.91%	0.68%	3.01%	1.60%	0.00%	3.81%	7.53%	6.94%	3.17%	5.56%	4.08%	0.00%	0.00%	5.88%	10.71%
1984	0.00%	0.00%	4.72%	4.95%	1.09%	1.11%	2.33%	0.00%	3.95%	7.81%	1.85%	2.17%	0.00%	0.00%	3.85%	0.00%	15.79%	0.00%	0.00%
1985	0.00%	0.75%	2.34%	0.00%	1.67%	0.85%	0.86%	3.57%	2.88%	3.23%	2.47%	1.47%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1986	0.00%	1.56%	2.52%	2.63%	2.75%	0.94%	1.92%	6.06%	6.67%	6.41%	0.00%	1.67%	1.85%	4.08%	4.65%	2.63%	0.00%	3.45%	0.00%
1987	0.00%	0.00%	2.90%	1.53%	1.57%	5.65%	4.35%	5.83%	5.43%	1.23%	1.45%	0.00%	1.89%	8.89%	2.86%	0.00%	0.00%	5.00%	0.00%
1988	0.00%	0.00%	3.54%	0.92%	4.67%	5.05%	3.30%	4.55%	1.28%	4.35%	3.39%	0.00%	0.00%	2.50%	3.13%	0.00%	3.45%	0.00%	0.00%
1989	0.00%	4.48%	0.80%	1.63%	3.33%	3.48%	3.64%	0.97%	0.00%	4.65%	0.00%	8.06%	1.92%	0.00%	0.00%	2.70%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	6.52%	5.81%	3.70%	2.70%	1.41%	2.99%	0.00%	0.00%	2.13%	5.13%	0.00%	0.00%	3.13%	0.00%	0.00%	0.00%	0.00%
1991	0.00%	2.70%	2.78%	2.90%	1.49%	1.52%	0.00%	0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	3.45%	0.00%	4.00%	4.35%	0.00%
1992	0.00%	1.92%	5.88%	2.08%	0.00%	0.00%	2.33%	2.44%	0.00%	6.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%
1993	0.00%	0.00%	8.62%	1.92%	0.00%	0.00%	4.17%	0.00%	0.00%	2.70%	0.00%	3.45%	0.00%	0.00%	0.00%	5.00%	10.53%	0.00%	0.00%
1994	0.00%	0.00%	2.44%	0.00%	2.56%	0.00%	8.82%	3.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1995	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	4.76%
1997	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.78%	2.94%	0.00%	0.00%	0.00%	3.57%	0.00%
1998	0.00%	0.00%	2.78%	0.00%	0.00%	2.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1999	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00%	0.00%	0.00%	0.00%	5.26%	5.88%	12.50%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%
2001	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2002	0.00%	0.00%	4.35%	0.00%	0.00%	0.00%	0.00%	4.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2003	0.00%	0.00%	0.00%	3.45%	0.00%	0.00%	7.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2004	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.33%	0.00%	0.00%
2005	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2006	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2007	0.00%	0.00%	0.00%	0.00%	3.23%	0.00%	0.00%	0.00%	3.33%	3.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
2008	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
2009	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
2010	0.00%	0.00%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
2011	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
2012	0.00%	0.00%	0.00%	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%	0.00%							
2013	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
2014	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
2015	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
2017	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%												
2018	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
2019	0.00%	0.00%	0.00%	0.00%	0.00%														
2020	0.00%	0.00%	0.00%	0.00%															
2021	0.00%	0.00%	0.00%																
2022	0.00%	0.00%																	
2023	0.00%																		
Wtd Avg	0.00073																		
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	1.59%	0.00%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%	0.00%	0.00%
10 Yr	0.00%	0.00%	0.70%	0.65%	0.00%	1.17%	0.00%	0.48%	0.94%	0.47%	0.92%	0.00%	0.00%	0.00%	0.49%	0.00%	0.51%	0.51%	0.50%
15 Yr	0.00%	0.00%	0.39%	0.75%	0.37%	0.69%	0.66%	0.63%	0.60%	0.31%	0.65%	0.00%	0.32%	0.64%	0.32%	0.00%	0.98%	0.71%	0.36%
All Yr	0.00%	0.58%	1.87%	1.72%	1.56%	1.58%	1.68%	1.68%	1.67%	1.85%	1.46%	1.86%	1.60%	1.94%	1.74%	1.23%	1.68%	1.66%	0.84%
All Avg Rolling	0	0.000721562	0.002949	0.005548714	0.006677	0.008396	0.007744	0.00845	0.006948	0.007188	0.008186	0.00705	0.006462	0.005299	0.00587	0.005293	0.006562	0.006845	0.007237
Linear Smoothed	0.00%	0.53%	0.54%	0.55%	0.56%	0.58%	0.59%	0.60%	0.61%	0.62%	0.64%	0.65%	0.66%	0.67%	0.69%	0.70%	0.71%	0.72%	0.58%
Prior Sel	0.00%	0.93%	0.91%	0.90%	0.88%	0.86%	0.85%	0.83%	0.81%	0.80%	0.78%	0.76%	0.75%	0.73%	0.72%	0.70%	0.68%	0.67%	0.65%
Selected	0.00%	0.18%	0.37%	0.52%	0.62%	0.69%	0.73%	0.75%	0.75%	0.74%	0.74%	0.73%	0.72%	0.70%	0.69%	0.67%	0.66%	0.64%	0.62%
Active	0.00%	0.13%	0.26%	0.36%	0.44%	0.48%	0.51%	0.52%	0.53%	0.52%	0.52%	0.51%	0.50%	0.49%	0.48%	0.47%	0.46%	0.45%	0.44%
Inactive	0.00%	0.29%	0.60%	0.83%	1.00%	1.11%	1.17%	1.20%	1.20%	1.19%	1.18%	1.16%	1.14%	1.12%	1.10%	1.08%	1.05%	1.03%	1.00%
Phased Release	0.00%	0.33%	0.69%	0.96%	1.15%	1.28%	1.35%	1.38%	1.39%	1.38%	1.36%	1.34%	1.32%	1.30%	1.27%	1.25%	1.22%	1.19%	1.16%

Surface
Percent Forfeited

Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	15.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	27.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1981	2.17%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1982	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1983	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1984	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%
1985	8.33%	0.00%	0.00%	0.00%	0.00%	15.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1986	0.00%	4.35%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	
1987	0.00%	0.00%	0.00%	5.56%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1988	0.00%	3.85%	4.17%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1989	3.57%	4.00%	0.00%	0.00%	4.76%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1990	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1991	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1992	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1995	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%										
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1997	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1998	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1999	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
2000	0.00%	0.00%	0.00%	0.00%	0.00%															
2001	0.00%	0.00%	0.00%	0.00%																
2002	5.00%	0.00%	0.00%																	
2003	0.00%	0.00%																		
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5 Yr	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
10 Yr	0.50%	0.00%	0.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.95%	1.06%	0.00%	0.00%	0.00%
15 Yr	0.35%	0.36%	0.74%	0.38%	2.40%	1.22%	0.42%	0.00%	0.00%	1.46%	1.60%	0.58%	0.60%	0.00%	0.65%	0.72%	0.80%	0.00%	0.00%	0.00%
All Yr	0.91%	1.02%	1.14%	0.21%	1.38%	1.26%	0.27%	0.31%	0.35%	1.52%	1.29%	0.48%	0.52%	0.00%	0.62%	0.70%	0.79%	0.00%	0.00%	0.00%
All Avg Rolling	0.006106	0.004847	0.005472	0.003676	0.005682	0.005708	0.00579	0.002898	0.001121	0.004902	0.007053	0.007642	0.004211	0.001804	0.001981	0.003031	0.006907	0.005852	0.003876	0
Linear Smoothed	0.57%	0.56%	0.55%	0.54%	0.53%	0.52%	0.51%	0.50%	0.49%	0.48%	0.47%	0.46%	0.45%	0.44%	0.43%	0.42%	0.41%	0.40%	0.39%	0.38%
Prior Sel	0.63%	0.62%	0.60%	0.58%	0.57%	0.55%	0.53%	0.52%	0.50%	0.48%	0.47%	0.45%	0.43%	0.42%	0.40%	0.39%	0.37%	0.35%	0.34%	0.32%
Selected	0.61%	0.59%	0.57%	0.55%	0.52%	0.49%	0.47%	0.45%	0.42%	0.40%	0.38%	0.36%	0.34%	0.33%	0.31%	0.30%	0.28%	0.27%	0.25%	0.24%
Active	0.42%	0.41%	0.40%	0.38%	0.36%	0.35%	0.33%	0.31%	0.30%	0.28%	0.27%	0.25%	0.24%	0.23%	0.22%	0.21%	0.20%	0.19%	0.18%	0.17%
Inactive	0.97%	0.94%	0.91%	0.87%	0.83%	0.79%	0.75%	0.71%	0.68%	0.64%	0.61%	0.58%	0.55%	0.52%	0.50%	0.47%	0.45%	0.43%	0.41%	0.38%
Phased Release	1.12%	1.09%	1.05%	1.01%	0.96%	0.91%	0.87%	0.82%	0.78%	0.74%	0.71%	0.67%	0.64%	0.61%	0.58%	0.55%	0.52%	0.49%	0.47%	0.44%

Surface
Percent Forfeited

Issue Year	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
1980	0.00%	0.00%	0.00%	0.00%	0.00%															
1981	0.00%	0.00%	0.00%	0.00%																
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Wtd Avg																				
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linear Smoothed	0.37%	0.36%	0.35%	0.34%	0.33%	0.32%	0.32%	0.31%	0.30%	0.29%	0.28%	0.27%	0.26%	0.25%	0.24%	0.23%	0.22%	0.21%	0.20%	0.19%
Prior Sel	0.30%	0.29%	0.27%	0.25%	0.24%	0.22%	0.20%	0.19%	0.17%	0.15%	0.14%	0.12%	0.10%	0.09%	0.07%	0.06%	0.04%	0.02%		
Selected	0.23%	0.22%	0.21%	0.20%	0.19%	0.18%	0.17%	0.16%	0.15%	0.14%	0.14%	0.13%	0.12%	0.12%	0.11%	0.11%	0.10%	0.10%	0.09%	0.09%
Active	0.16%	0.15%	0.14%	0.14%	0.13%	0.12%	0.12%	0.11%	0.11%	0.10%	0.10%	0.09%	0.09%	0.08%	0.08%	0.07%	0.07%	0.07%	0.06%	0.06%
Inactive	0.37%	0.35%	0.33%	0.31%	0.30%	0.28%	0.27%	0.26%	0.24%	0.23%	0.22%	0.21%	0.20%	0.19%	0.18%	0.17%	0.16%	0.15%	0.15%	0.14%
Phased Release	0.42%	0.40%	0.38%	0.36%	0.34%	0.33%	0.31%	0.30%	0.28%	0.27%	0.25%	0.24%	0.23%	0.22%	0.21%	0.20%	0.19%	0.18%	0.17%	0.16%

x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Surface																			
Percent Released																			
Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	28.57%	0.00%
1969	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	28.57%	0.00%
1970	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	20.00%	12.50%	28.57%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	22.22%	0.00%	15.38%	18.18%	0.00%
1972	0.00%	0.00%	0.00%	4.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	42.11%	36.36%	42.86%	75.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	13.64%	15.79%	31.25%	9.09%	0.00%	20.00%	0.00%	14.29%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	29.73%	15.38%	9.09%	20.00%	12.50%	7.14%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	4.21%	24.72%	25.37%	17.02%	18.42%	13.33%	4.00%	8.33%	9.09%	20.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	7.41%	24.32%	23.64%	12.50%	11.43%	6.67%	3.70%	23.08%	5.00%	0.00%	5.56%
1977	0.00%	0.00%	0.00%	0.88%	0.00%	0.00%	0.00%	7.69%	20.83%	26.32%	14.81%	22.22%	8.57%	9.38%	7.41%	12.00%	4.55%	9.52%	5.56%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.95%	16.20%	19.30%	8.14%	18.18%	19.35%	2.04%	4.26%	6.82%	2.56%	10.53%	6.06%	6.67%
1979	0.00%	0.00%	0.00%	0.00%	0.00%	3.90%	12.33%	14.29%	13.46%	4.55%	4.76%	7.50%	0.00%	11.11%	6.45%	10.34%	12.50%	5.26%	11.76%
1980	0.00%	0.00%	0.00%	0.00%	2.65%	5.45%	3.92%	5.15%	7.61%	7.06%	6.33%	8.22%	7.81%	14.55%	4.44%	7.14%	16.22%	3.23%	3.33%
1981	0.00%	0.00%	0.00%	4.35%	2.63%	4.14%	6.52%	3.10%	4.80%	5.13%	3.64%	4.72%	7.07%	4.44%	7.14%	1.33%	15.49%	10.34%	11.54%
1982	0.00%	0.00%	3.23%	6.74%	8.64%	4.17%	4.35%	9.23%	5.08%	8.93%	7.84%	16.28%	15.15%	23.08%	20.00%	0.00%	28.57%	20.00%	12.50%
1983	0.00%	0.53%	3.19%	10.00%	4.46%	8.84%	3.01%	8.00%	7.08%	7.62%	15.05%	5.56%	11.11%	3.70%	8.16%	6.98%	15.00%	11.76%	3.57%
1984	0.00%	0.93%	0.00%	3.96%	1.09%	3.33%	3.49%	6.17%	11.84%	7.81%	12.96%	17.39%	10.81%	21.21%	7.69%	17.39%	0.00%	6.25%	6.67%
1985	0.00%	3.01%	3.13%	0.83%	0.00%	0.85%	2.59%	3.57%	7.69%	9.68%	13.58%	10.29%	16.67%	17.39%	18.42%	12.90%	7.41%	0.00%	4.00%
1986	0.78%	5.47%	1.68%	1.75%	0.00%	0.94%	2.88%	3.03%	6.67%	11.54%	6.25%	8.33%	7.41%	8.16%	6.98%	13.16%	9.38%	6.90%	7.69%
1987	0.71%	1.43%	2.17%	1.53%	0.79%	1.61%	6.09%	4.85%	6.52%	13.58%	14.49%	8.62%	13.21%	13.33%	14.29%	24.14%	9.09%	0.00%	0.00%
1988	0.87%	1.74%	0.00%	0.92%	2.80%	3.03%	0.00%	6.82%	10.26%	10.14%	15.25%	8.33%	9.09%	17.50%	6.25%	0.00%	0.00%	3.57%	0.00%
1989	0.00%	2.24%	0.80%	0.81%	0.83%	0.87%	2.73%	4.85%	11.34%	9.30%	16.22%	8.06%	7.69%	14.89%	7.50%	2.70%	5.71%	6.06%	9.68%
1990	0.00%	0.00%	0.00%	0.00%	4.94%	1.35%	4.23%	8.96%	3.39%	17.54%	14.89%	7.69%	2.94%	3.03%	0.00%	0.00%	3.23%	6.67%	3.57%
1991	0.00%	0.00%	1.39%	0.00%	0.00%	0.00%	1.54%	12.50%	8.93%	16.00%	16.67%	11.43%	0.00%	6.45%	3.45%	7.41%	4.00%	13.04%	0.00%
1992	0.00%	0.00%	0.00%	0.00%	6.38%	2.27%	2.33%	2.44%	20.51%	22.58%	9.09%	20.00%	0.00%	12.50%	7.14%	15.38%	9.09%	0.00%	0.00%
1993	0.00%	1.69%	1.72%	3.85%	0.00%	2.04%	2.08%	6.67%	11.90%	10.81%	9.38%	3.45%	3.70%	7.69%	16.67%	0.00%	5.26%	0.00%	0.00%
1994	0.00%	2.38%	2.44%	0.00%	0.00%	10.53%	2.94%	3.33%	0.00%	14.29%	4.17%	8.70%	0.00%	14.29%	0.00%	0.00%	16.67%	6.67%	0.00%
1995	0.00%	0.00%	0.00%	2.50%	0.00%	2.56%	8.11%	11.76%	6.67%	0.00%	7.14%	3.85%	4.00%	0.00%	0.00%	4.35%	0.00%	4.55%	4.76%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.90%	3.70%	0.00%	0.00%	3.85%	0.00%	8.33%	0.00%	0.00%	4.55%	4.76%
1997	0.00%	4.26%	2.22%	0.00%	4.55%	0.00%	0.00%	4.76%	5.00%	2.63%	2.70%	0.00%	2.78%	5.88%	3.23%	3.33%	3.45%	0.00%	0.00%
1998	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	6.06%	3.23%	0.00%	6.67%	0.00%	3.57%	0.00%	0.00%	0.00%	0.00%	0.00%
1999	0.00%	0.00%	17.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	10.00%	11.11%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	9.09%	0.00%	11.11%	0.00%	12.50%
2001	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%
2002	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2003	0.00%	0.00%	0.00%	0.00%	0.00%	3.57%	0.00%	4.00%	0.00%	4.17%	4.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2004	0.00%	0.00%	3.03%	0.00%	0.00%	3.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.23%	3.33%	0.00%	0.00%
2005	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%
2006	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2007	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.33%	3.57%	0.00%	0.00%	3.85%	0.00%	0.00%	0.00%	0.00%		
2008	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.35%	4.55%	0.00%	14.29%	0.00%	0.00%	0.00%			
2009	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%	4.35%	4.55%	0.00%	0.00%				
2010	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%					
2011	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%						
2012	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
2013	0.00%	0.00%	0.00%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
2014	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
2015	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
2017	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
2018	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
2019	0.00%	0.00%	0.00%	0.00%	0.00%														
2020	0.00%	0.00%	0.00%	0.00%															
2021	0.00%	0.00%	0.00%																
2022	0.00%	0.00%																	
2023	0.00%																		
Wtd Avg																			
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.89%	0.99%	5.83%	0.00%	0.00%	0.95%	0.93%	1.98%	0.00%
10 Yr	0.00%	0.00%	0.70%	0.65%	0.64%	0.00%	0.00%	0.00%	0.47%	1.42%	1.38%	0.47%	2.90%	0.00%	0.98%	0.53%	1.03%	1.03%	1.00%
15 Yr	0.00%	0.00%	0.39%	0.38%	0.74%	0.34%	0.00%	0.31%	0.30%	1.23%	1.62%	1.62%	2.53%	1.28%	1.58%	0.98%	2.30%	1.79%	1.08%
All Yr	0.10%	0.85%	1.00%	1.75%	1.45%	2.00%	2.60%	5.16%	7.05%	8.33%	9.45%	8.78%	6.78%	8.57%	6.95%	5.73%	7.51%	5.61%	4.62%
All Avg Rolling	0.001014	0.00118781	0.002539	0.004769028	0.006421	0.006629	0.006482	0.008679	0.013247	0.020228	0.027622	0.030987	0.036866	0.033124	0.031162	0.022959	0.024548	0.025287	0.024038
Linear Smoothed	0.10%	0.12%	0.20%	0.28%	0.59%	0.91%	1.22%	1.54%	1.85%	2.17%	2.48%	2.80%	3.11%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%
Prior Sel	0.10%	0.12%	0.14%	0.45%	0.76%	1.08%	1.39%	1.70%	2.01%	2.32%	2.64%	3.73%	3.67%	3.61%	3.56%	3.50%	3.44%	3.38%	3.32%
Selected	0.00%	0.14%	0.49%	0.78%	1.03%	1.23%	1.40%	1.54%	1.66%	1.76%	1.87%	1.96%	2.05%	2.14%	2.22%	2.29%	2.36%	2.42%	2.48%
Active	0.00%	0.12%	0.42%	0.67%	0.87%	1.05%	1.19%	1.31%	1.41%	1.50%	1.59%	1.67%	1.75%	1.82%	1.89%	1.95%	2.01%	2.06%	2.11%
Inactive	0.00%	0.07%	0.25%	0.39%	0.51%	0.62%	0.70%	0.77%	0.83%	0.88%	0.93%	0.98%	1.03%	1.07%	1.11%	1.15%	1.18%	1.21%	1.24%
Phased Release	0.00%	0.33%	1.13%	1.80%	2.36%	2.83%	3.22%	3.54%	3.82%	4.06%	4.29%	4.51%	4.72%	4.92%	5.10%	5.28%	5.43%	5.58%	5.71%

x	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Surface																				
Percent Released																				
Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	20.00%	50.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	14.29%	33.33%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	16.67%	0.00%	40.00%	66.67%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	16.67%	0.00%	0.00%	30.00%	28.57%	20.00%	25.00%	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	6.25%	26.67%	18.18%	11.11%	25.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	33.33%	0.00%	0.00%
1976	11.76%	0.00%	6.67%	0.00%	7.14%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	12.50%
1977	17.65%	0.00%	7.14%	7.69%	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	18.52%	13.64%	10.53%	0.00%	5.88%	6.25%	13.33%	0.00%	7.69%	0.00%	0.00%	0.00%	9.09%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	13.33%	15.38%	0.00%	0.00%	9.09%	20.00%	0.00%	12.50%	14.29%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%
1980	3.45%	14.29%	12.50%	5.26%	16.67%	6.67%	14.29%	0.00%	8.33%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%
1981	6.52%	4.76%	2.63%	5.41%	5.71%	6.06%	6.45%	3.45%	0.00%	0.00%	3.85%	4.00%	4.35%	0.00%	4.55%	4.76%	0.00%	5.00%	5.26%	0.00%
1982	16.67%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%
1983	4.17%	9.09%	15.00%	0.00%	6.25%	0.00%	6.67%	7.14%	7.69%	8.33%	0.00%	0.00%	18.18%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	12.50%
1984	0.00%	7.14%	0.00%	0.00%	8.33%	0.00%	0.00%	10.00%	0.00%	11.11%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	16.67%	20.00%	0.00%
1985	16.67%	11.11%	0.00%	0.00%	18.75%	7.69%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1986	4.17%	0.00%	0.00%	4.55%	0.00%	5.56%	0.00%	11.76%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1987	0.00%	5.26%	0.00%	5.56%	12.50%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	9.09%	10.00%	0.00%	0.00%	0.00%	0.00%		
1988	3.70%	3.85%	0.00%	13.04%	5.00%	11.11%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%			
1989	7.14%	8.00%	4.55%	0.00%	0.00%	0.00%	10.53%	0.00%	0.00%	11.76%	0.00%	0.00%	0.00%	0.00%	6.67%	0.00%				
1990	0.00%	3.70%	7.69%	8.33%	4.55%	9.52%	0.00%	0.00%	5.26%	5.56%	0.00%	0.00%	5.88%	0.00%	0.00%					
1991	0.00%	15.79%	6.25%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1992	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	12.50%	0.00%	14.29%	0.00%	0.00%	0.00%							
1993	0.00%	12.50%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1994	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%									
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%										
1996	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	5.56%	0.00%	5.88%											
1997	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1998	3.70%	3.85%	4.00%	0.00%	0.00%	0.00%	0.00%													
1999	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%														
2000	0.00%	0.00%	0.00%	0.00%	0.00%															
2001	0.00%	0.00%	0.00%	0.00%																
2002	0.00%	0.00%	0.00%																	
2003	4.55%	0.00%																		
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2023																				
Wtd Avg																				
5 Yr	0.99%	0.00%	1.22%	1.14%	0.00%	0.00%	1.00%	0.00%	2.90%	1.54%	1.59%	0.00%	2.99%	1.45%	1.47%	0.00%	0.00%	2.27%	5.41%	5.00%
10 Yr	1.00%	1.09%	1.71%	1.24%	0.00%	1.83%	2.30%	0.62%	2.05%	2.82%	1.56%	0.82%	5.04%	1.82%	1.72%	0.95%	0.00%	3.45%	4.82%	4.05%
15 Yr	0.70%	3.57%	2.57%	3.05%	1.60%	3.25%	2.08%	2.23%	2.03%	3.90%	2.66%	1.16%	4.76%	1.86%	1.30%	0.72%	1.60%	3.70%	4.17%	3.80%
All Yr	5.15%	6.43%	4.56%	3.56%	5.75%	5.04%	4.64%	2.78%	2.78%	3.80%	3.02%	0.95%	4.12%	1.68%	1.23%	0.70%	1.57%	3.64%	5.15%	3.80%
All Avg Rolling	0.020769	0.021346	0.024162	0.025129	0.022011	0.022052	0.022911	0.021481	0.021183	0.022877	0.02554	0.019846	0.02389	0.022206	0.02454	0.012422	0.009395	0.015506	0.029818	0.041047
Linear Smoothed	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%
Prior Sel	3.26%	3.21%	3.15%	3.09%	3.03%	2.97%	2.91%	2.85%	2.80%	2.74%	2.68%	2.62%	2.56%	2.50%	2.45%	2.39%	2.33%	2.27%	2.21%	2.15%
Selected	2.53%	2.58%	2.62%	2.65%	2.67%	2.69%	2.71%	2.72%	2.72%	2.71%	2.70%	2.68%	2.66%	2.63%	2.59%	2.54%	2.49%	2.43%	2.37%	2.29%
Active	2.15%	2.19%	2.22%	2.25%	2.27%	2.29%	2.30%	2.31%	2.31%	2.31%	2.30%	2.28%	2.26%	2.23%	2.20%	2.16%	2.12%	2.07%	2.01%	1.95%
Inactive	1.27%	1.29%	1.31%	1.32%	1.34%	1.35%	1.35%	1.36%	1.36%	1.36%	1.35%	1.34%	1.33%	1.31%	1.29%	1.27%	1.25%	1.22%	1.18%	1.15%
Phased Release	5.82%	5.93%	6.01%	6.09%	6.15%	6.20%	6.23%	6.25%	6.25%	6.24%	6.21%	6.17%	6.11%	6.04%	5.95%	5.85%	5.73%	5.59%	5.44%	5.28%

x		40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Surface																					
Percent Released																					
Issue Year		480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
	1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
	1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
	1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
	1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
	1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
	1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
	1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
	1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
	1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
	1976	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
	1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
	1978	12.50%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%													
	1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
	1980	0.00%	16.67%	40.00%	33.33%	0.00%															
	1981	0.00%	0.00%	5.56%	11.76%																
	1982	0.00%	0.00%	0.00%																	
	1983	0.00%	0.00%																		
	1984	0.00%																			
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Wtd Avg																					
5 Yr		0.00%	2.70%	8.33%	10.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr		1.52%	1.59%	7.27%	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr		1.45%	1.56%	7.14%	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr		1.45%	1.56%	7.14%	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling		0.033841	0.023731	0.034767	0.059636	0.053457	0.028547	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linear Smoothed		2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%	2.64%
Prior Sel		2.09%	2.04%	1.98%	1.92%	1.86%	1.80%	1.74%	1.69%	1.63%	1.57%	1.51%	1.45%	1.39%	1.34%	1.28%	1.22%	1.16%	1.10%		
Selected		2.21%	2.13%	2.03%	1.93%	1.83%	1.71%	1.64%	1.58%	1.51%	1.45%	1.39%	1.34%	1.29%	1.23%	1.18%	1.14%	1.09%	1.05%	1.01%	0.97%
Active		1.88%	1.81%	1.73%	1.64%	1.55%	1.45%	1.40%	1.34%	1.29%	1.23%	1.19%	1.14%	1.09%	1.05%	1.01%	0.97%	0.93%	0.89%	0.86%	0.82%
Inactive		1.11%	1.06%	1.02%	0.97%	0.91%	0.86%	0.82%	0.79%	0.76%	0.73%	0.70%	0.67%	0.64%	0.62%	0.59%	0.57%	0.55%	0.52%	0.50%	0.48%
Phased Release		5.09%	4.90%	4.68%	4.45%	4.20%	3.93%	3.78%	3.63%	3.48%	3.34%	3.21%	3.08%	2.96%	2.84%	2.72%	2.62%	2.51%	2.41%	2.31%	2.22%

Underground
Total Permits

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
1977	36	36	35	33	32	30	28	28	19	16	14	14	11	11	9	9	8	8	8
1978	103	102	99	94	91	86	75	55	49	41	38	38	35	32	32	29	28	26	24
1979	71	70	65	64	63	58	47	40	36	36	35	35	35	35	34	34	33	32	29
1980	107	107	107	106	92	78	72	67	65	61	60	60	59	57	56	53	46	45	42
1981	178	178	177	172	157	149	148	142	138	136	133	131	129	127	124	113	99	90	83
1982	102	102	100	97	93	90	86	84	83	82	78	77	74	69	54	44	36	34	29
1983	306	303	286	276	256	232	219	214	204	185	172	163	150	134	126	118	108	95	84
1984	191	187	181	171	152	131	124	119	112	106	99	90	88	77	73	58	55	46	46
1985	90	87	83	78	72	66	61	60	58	57	49	42	34	34	32	28	25	23	19
1986	96	95	90	87	84	81	78	76	74	69	57	49	44	38	30	24	24	22	20
1987	107	104	101	96	94	89	88	84	76	71	65	61	56	41	36	33	29	28	28
1988	175	170	163	156	139	126	115	97	87	83	71	65	52	44	38	33	31	28	28
1989	130	128	124	112	105	92	86	77	69	65	56	47	42	39	32	32	31	28	25
1990	52	50	48	47	43	41	39	38	32	31	27	25	24	22	18	17	16	16	15
1991	47	43	41	41	37	37	31	31	31	28	25	25	21	20	19	19	19	19	18
1992	49	49	49	45	45	44	43	42	41	35	32	31	31	28	28	26	25	24	22
1993	56	53	46	45	42	40	39	39	37	37	35	32	30	30	29	26	25	25	24
1994	56	55	54	54	51	48	47	45	45	44	43	39	38	36	34	33	31	30	29
1995	43	43	41	40	38	36	35	33	33	32	32	30	28	25	24	24	21	21	21
1996	45	44	44	44	40	37	37	36	36	34	34	31	30	29	29	28	27	27	25
1997	43	42	42	42	41	41	38	37	37	37	33	32	31	31	29	29	29	29	29
1998	37	37	37	37	34	32	30	29	29	28	25	24	24	23	23	22	19	19	19
1999	35	35	34	34	33	31	31	31	31	31	30	29	29	29	29	28	27	24	23
2000	31	31	31	31	30	30	30	27	27	27	26	25	25	24	24	24	23	20	19
2001	20	20	20	20	20	20	18	18	18	17	17	16	16	16	16	16	12	12	12
2002	26	26	26	26	26	24	24	24	22	22	20	20	19	19	18	16	16	15	13
2003	31	31	30	30	29	28	28	28	26	26	25	24	24	23	23	22	22	22	20
2004	23	22	21	21	19	19	19	18	18	16	15	15	15	15	13	13	12	12	12
2005	18	18	18	18	18	17	17	17	16	15	15	15	15	14	14	14	14	13	13
2006	20	20	20	19	19	19	18	18	18	18	18	17	17	16	16	16	16	16	
2007	22	22	22	22	21	21	21	21	20	20	16	16	16	16	16	15	15		
2008	21	21	18	18	17	16	16	16	16	15	15	15	15	14	14	12			
2009	19	19	19	19	19	19	19	19	17	17	17	17	17	17	15				
2010	26	26	26	24	24	24	22	20	20	20	20	20	19	17					
2011	18	18	17	17	17	17	16	16	16	16	15	15	15						
2012	17	17	15	14	13	10	10	10	10	10	9	8							
2013	19	18	18	17	17	17	17	17	16	16	16								
2014	29	29	29	24	23	23	23	23	23	23									
2015	9	8	8	8	8	8	8	8	8										
2016	7	7	7	7	7	6	6	6											
2017	7	7	7	7	7	7	7												
2018	5	5	5	5	5	5													
2019	4	4	4	4	4														
2020	7	7	7	7															
2021	7	7	7																
2022	4	4																	
2023	3																		

Underground
Total Permits

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1977	7	6	5	5	4	4	4	4	4	4	4	3	2	2	2	2	2	2	2	2
1978	21	20	19	15	14	12	11	11	11	10	9	9	8	8	7	7	7	7	7	7
1979	28	25	25	21	21	19	19	18	18	17	16	14	14	13	11	10	10	10	10	10
1980	40	36	34	30	26	25	18	15	14	14	14	12	12	12	11	11	11	10	10	10
1981	79	66	61	55	50	45	45	42	38	38	36	36	35	35	31	31	30	30	30	30
1982	24	23	23	21	18	16	16	15	15	14	13	12	12	11	10	10	10	10	9	8
1983	79	75	73	68	63	59	52	51	51	49	49	44	44	44	44	44	44	43	42	41
1984	41	41	41	38	34	32	31	30	28	27	24	24	23	22	22	20	20	19	19	19
1985	19	19	17	15	13	11	11	11	11	10	10	10	10	9	8	8	7	7	7	7
1986	19	15	15	14	12	10	10	9	9	9	9	9	9	9	9	9	9	9	9	
1987	26	22	20	16	16	16	15	15	15	15	13	12	11	11	10	10	10	9		
1988	26	25	25	24	23	22	20	19	19	19	19	18	18	17	17	17	17			
1989	25	23	21	21	20	19	19	19	19	19	18	18	18	17	16	16				
1990	13	13	12	12	11	11	10	10	10	10	10	10	10	10	10					
1991	17	16	14	14	14	14	14	13	12	11	11	9	9	9						
1992	22	22	21	21	19	18	17	16	16	15	15	15	15							
1993	23	19	19	19	19	19	18	18	18	18	18	18								
1994	27	26	25	24	24	17	17	17	17	16	16									
1995	20	20	20	20	19	18	18	17	16	15										
1996	23	23	20	18	18	18	17	17	17											
1997	29	28	27	26	26	25	23	23												
1998	18	17	16	16	16	16	15													
1999	23	21	20	20	20	20														
2000	19	19	18	18	18															
2001	11	11	11	11																
2002	11	11	10																	
2003	20	18																		
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2022																				
2023																				

Underground
Total Permits

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	1	1	1	1	1	1	1	1	1											
1977	2	2	1	1	1	1	1	0												
1978	6	6	6	6	6	5	5													
1979	10	10	10	10	10	10														
1980	10	10	10	10	10															
1981	30	29	29	27																
1982	8	7	7																	
1983	40	40																		
1984	18																			
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2022																				
2023																				

Underground
Total Releases

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	1	0	0	6	2	2	0	3	0	1	0	1	0	0
1978	0	0	0	0	0	0	8	15	3	7	3	0	2	2	0	1	0	1	1
1979	0	1	0	0	0	3	8	3	4	0	0	0	0	0	1	0	1	1	2
1980	0	0	0	0	7	7	3	3	2	4	1	0	1	1	1	2	6	1	2
1981	0	0	0	3	10	4	1	6	4	1	3	1	1	1	0	9	11	8	6
1982	0	0	2	2	3	3	4	2	1	1	4	1	1	3	11	9	7	2	4
1983	0	1	16	6	16	21	12	3	9	13	11	3	8	11	6	8	8	10	10
1984	0	1	3	6	10	18	2	4	6	3	5	5	1	8	2	15	3	8	0
1985	0	3	1	5	3	2	3	0	0	1	5	6	5	0	2	2	2	2	3
1986	0	1	2	2	2	2	2	1	1	1	9	6	5	6	7	5	0	1	2
1987	1	2	1	3	2	4	1	1	5	3	5	2	5	12	3	3	3	1	0
1988	4	4	3	5	15	5	8	7	7	3	6	5	9	7	6	3	1	2	0
1989	0	0	4	9	3	9	4	9	5	3	7	7	3	2	4	0	1	2	3
1990	0	1	1	0	3	2	0	0	5	1	3	2	0	2	4	1	1	0	1
1991	0	1	1	0	2	0	2	0	0	3	3	0	4	1	1	0	0	0	1
1992	0	0	0	1	0	0	1	0	1	6	2	0	0	3	0	2	1	1	2
1993	0	3	1	1	1	1	1	0	1	0	1	3	2	0	1	3	1	0	1
1994	0	0	0	0	2	3	1	2	0	1	1	4	1	2	2	1	2	1	1
1995	1	0	1	1	1	2	0	2	0	1	0	2	2	3	0	0	3	0	0
1996	0	1	0	0	2	3	0	1	0	2	0	2	1	1	0	1	1	0	1
1997	0	1	0	0	1	0	2	1	0	0	4	1	1	0	2	0	0	0	0
1998	0	0	0	0	3	1	2	1	0	1	3	0	0	1	0	1	3	0	0
1999	0	0	1	0	0	2	0	0	0	0	1	1	0	0	0	1	1	3	1
2000	0	0	0	0	1	0	0	3	0	0	1	1	0	1	0	0	1	3	1
2001	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	4	0	0
2002	0	0	0	0	0	2	0	0	2	0	2	0	1	0	1	2	0	1	2
2003	0	0	0	0	1	1	0	0	2	0	1	1	0	1	0	1	0	0	2
2004	0	1	1	0	2	0	0	1	0	2	1	0	0	0	2	0	1	0	0
2005	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	1	0
2006	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	
2007	0	0	0	0	1	0	0	0	1	0	4	0	0	0	0	1	0		
2008	0	0	3	0	1	1	0	0	0	1	0	0	0	1	0	1			
2009	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1				
2010	0	0	0	2	0	0	2	2	0	0	0	0	0	0					
2011	0	0	1	0	0	0	1	0	0	0	1	0	0						
2012	0	0	2	1	1	3	0	0	0	0	1	0							
2013	0	1	0	1	0	0	0	0	1	0	0								
2014	0	0	0	5	1	0	0	0	0	0									
2015	0	1	0	0	0	0	0	0	0										
2016	0	0	0	0	0	1	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Underground
Total Releases

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	1	1	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
1978	3	1	1	4	1	2	0	0	0	0	1	0	1	0	1	0	0	0	0	0
1979	0	1	0	4	0	2	0	1	0	1	1	1	0	1	2	1	0	0	0	0
1980	2	4	2	4	4	1	7	3	1	0	0	2	0	0	0	0	0	1	0	0
1981	4	12	5	5	5	5	0	3	4	0	2	0	1	0	4	0	1	0	0	0
1982	5	1	0	1	3	2	0	1	0	0	1	1	0	1	1	0	0	0	1	1
1983	2	3	2	4	5	3	7	0	0	2	0	2	0	0	0	0	0	1	1	1
1984	4	0	0	2	4	2	1	0	2	1	3	0	1	1	0	2	0	1	0	0
1985	0	0	1	2	2	2	0	0	0	0	0	0	0	1	1	0	1	0	0	0
1986	1	1	0	1	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	
1987	1	4	2	3	0	0	1	0	0	0	2	1	1	0	0	0	0	1		
1988	2	1	0	0	1	1	2	1	0	0	0	1	0	1	0	0	0			
1989	0	2	2	0	1	1	0	0	0	0	1	0	0	1	1	0				
1990	2	0	1	0	1	0	1	0	0	0	0	0	0	0	0					
1991	0	1	2	0	0	0	0	1	1	0	0	2	0	0						
1992	0	0	1	0	1	1	1	1	0	1	0	0	0							
1993	1	4	0	0	0	0	1	0	0	0	0	0								
1994	2	1	1	0	0	7	0	0	0	1	0									
1995	1	0	0	0	1	1	0	1	1	1										
1996	2	0	3	2	0	0	1	0	0											
1997	0	1	1	1	0	1	2	0												
1998	1	1	1	0	0	0	1													
1999	0	2	1	0	0	0														
2000	0	0	1	0	0															
2001	1	0	0	0																
2002	2	0	0																	
2003	0	2																		
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Underground
Total Releases

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	1	0	0	0	0	1												
1978	1	0	0	0	0	1	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
1981	0	0	0	2																
1982	0	1	0																	
1983	1	0																		
1984	1																			
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Underground
Total Forfeitures

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	1	2	1	1	2	0	3	1	0	0	0	0	1	0	0	0	0
1978	0	1	3	5	3	5	3	5	3	1	0	0	1	1	0	2	1	1	1
1979	0	0	5	1	1	2	3	4	0	0	1	0	0	0	0	0	0	0	1
1980	0	0	0	1	7	7	3	2	0	0	0	0	0	1	0	1	1	0	1
1981	0	0	1	2	5	4	0	0	0	1	0	1	1	1	3	2	3	1	1
1982	0	0	0	1	1	0	0	0	0	0	0	0	2	2	4	1	1	0	1
1983	0	2	1	4	4	3	1	2	1	6	2	6	5	5	2	0	2	3	1
1984	0	3	3	4	9	3	5	1	1	3	2	4	1	3	2	0	0	1	0
1985	0	0	3	0	3	4	2	1	2	0	3	1	3	0	0	2	1	0	1
1986	0	0	3	1	1	1	1	1	1	4	3	2	0	0	1	1	0	1	0
1987	0	1	2	2	0	1	0	3	3	2	1	2	0	3	2	0	1	0	0
1988	0	1	4	2	2	8	3	11	3	1	6	1	4	1	0	2	1	1	0
1989	0	2	0	3	4	4	2	0	3	1	2	2	2	1	3	0	0	1	0
1990	0	1	1	1	1	0	2	1	1	0	1	0	1	0	0	0	0	0	0
1991	0	3	1	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	3	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0
1993	0	0	6	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0
1994	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0
1996	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1997	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1999	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
2010	0	0	0	0	0	0	0	0	0	0	0	0	1	0					
2011	0	0	0	0	0	0	0	0	0	0	0	0	0						
2012	0	0	0	0	0	0	0	0	0	0	0	1							
2013	0	0	0	0	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Underground
Total Forfeitures

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
1979	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1981	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1983	2	1	0	1	0	1	0	1	0	0	0	3	0	0	0	0	0	0	0	0
1984	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1986	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0		
1988	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	1	0	0	0	0	0	0	0	0	1	0	0	0	0						
1992	0	0	0	0	0	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	1	0	0	0	0	0	0	0									
1995	0	0	0	0	0	0	0	0	0	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
1998	0	0	0	0	0	0	0													
1999	0	0	0	0	0	0														
2000	0	0	0	0	0															
2001	0	0	0	0																
2002	0	0	1																	
2003	0	0																		
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2023																				

Underground
Total Forfeitures

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	0	0	0	0	0	0	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
1981	0	1	0	0																
1982	0	0	0																	
1983	0	0																		
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2022																				
2023																				

Underground
Misc Terminations

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	2					
2011	0	0	0	0	0	0	0	0	0	0	0	0	0						
2012	0	0	0	0	0	0	0	0	0	0	0	0							
2013	0	0	0	0	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Underground
Misc Terminations

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1992	0	0	0	0	1	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	0	0	0	0	0	0	0	0									
1995	0	0	0	0	0	0	0	0	0	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
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Underground
Misc Terminations

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	0	0	0	0	0	0	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
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2023																				

Underground
Percent Forfeited

Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	2.78%	5.71%	3.03%	3.13%	6.67%	0.00%	10.71%	5.26%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%
1978	0.00%	0.97%	2.94%	5.05%	3.19%	5.49%	3.49%	6.67%	5.45%	2.04%	0.00%	0.00%	2.63%	2.86%	0.00%	6.25%	3.45%	3.57%	3.85%
1979	0.00%	0.00%	7.14%	1.54%	1.56%	3.17%	5.17%	8.51%	0.00%	0.00%	2.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.13%
1980	0.00%	0.00%	0.00%	0.93%	6.60%	7.61%	3.85%	2.78%	0.00%	0.00%	0.00%	0.00%	0.00%	1.69%	0.00%	1.79%	1.89%	0.00%	2.22%
1981	0.00%	0.00%	0.56%	1.13%	2.91%	2.55%	0.00%	0.00%	0.00%	0.72%	0.00%	0.75%	0.76%	0.78%	2.36%	1.61%	2.65%	1.01%	1.11%
1982	0.00%	0.00%	0.00%	1.00%	1.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.60%	2.70%	5.80%	1.85%	2.27%	0.00%	2.94%
1983	0.00%	0.65%	0.33%	1.40%	1.45%	1.17%	0.43%	0.91%	0.47%	2.94%	1.08%	3.49%	3.07%	3.33%	1.49%	0.00%	1.69%	2.78%	1.05%
1984	0.00%	1.57%	1.60%	2.21%	5.26%	1.97%	3.82%	0.81%	0.84%	2.68%	1.89%	4.04%	1.11%	3.41%	2.60%	0.00%	0.00%	1.82%	0.00%
1985	0.00%	0.00%	3.45%	0.00%	3.85%	5.56%	3.03%	1.64%	3.33%	0.00%	5.26%	2.04%	7.14%	0.00%	0.00%	6.25%	3.57%	0.00%	4.35%
1986	0.00%	0.00%	3.16%	1.11%	1.15%	1.19%	1.23%	1.28%	1.32%	5.41%	4.35%	3.51%	0.00%	0.00%	2.63%	3.33%	0.00%	4.17%	0.00%
1987	0.00%	0.93%	1.92%	1.98%	0.00%	1.06%	0.00%	3.41%	3.57%	2.63%	1.41%	3.08%	0.00%	5.36%	4.88%	0.00%	3.03%	0.00%	0.00%
1988	0.00%	0.57%	2.35%	1.23%	1.28%	5.76%	2.38%	9.57%	3.09%	1.15%	7.23%	1.41%	6.15%	1.92%	0.00%	5.26%	3.03%	3.23%	0.00%
1989	0.00%	1.54%	0.00%	2.42%	3.57%	3.81%	2.17%	0.00%	3.90%	1.45%	3.08%	3.57%	4.26%	2.38%	7.69%	0.00%	0.00%	3.23%	0.00%
1990	0.00%	1.92%	2.00%	2.08%	2.13%	0.00%	4.88%	2.56%	2.63%	0.00%	3.23%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1991	0.00%	6.38%	2.33%	0.00%	4.88%	0.00%	10.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1992	0.00%	0.00%	0.00%	6.12%	0.00%	2.22%	0.00%	2.33%	0.00%	0.00%	2.86%	3.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1993	0.00%	0.00%	11.32%	0.00%	2.22%	2.38%	0.00%	0.00%	2.56%	0.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1994	0.00%	1.79%	1.82%	0.00%	1.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1995	0.00%	0.00%	2.33%	0.00%	2.50%	0.00%	2.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	0.00%	4.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
1997	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1998	0.00%	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1999	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2001	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2002	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2003	0.00%	0.00%	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2004	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2005	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2006	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2007	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
2008	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%			
2009	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.88%				
2010	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%					
2011	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
2012	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%							
2013	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
2014	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
2015	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
2017	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
2018	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
2019	0.00%	0.00%	0.00%	0.00%	0.00%														
2020	0.00%	0.00%	0.00%	0.00%															
2021	0.00%	0.00%	0.00%																
2022	0.00%	0.00%																	
2023	0.00%																		
Wtd Avg																			
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.32%	1.20%	0.00%	1.30%	1.37%	0.00%	0.00%	0.00%
10 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%	0.57%	0.00%	0.57%	0.55%	0.00%	0.00%	0.52%
15 Yr	0.00%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.35%	0.00%	0.71%	0.33%	0.00%	0.64%	0.31%	0.00%	0.00%	0.32%
All Yr	0.00%	0.59%	1.48%	1.36%	2.15%	2.11%	1.63%	1.67%	1.22%	1.29%	1.43%	1.56%	1.51%	1.39%	1.68%	1.10%	1.10%	0.99%	0.96%
All Avg Rolling	0	0.000735294	0.00172	0.003231334	0.004532	0.005062	0.004909	0.004511	0.003765	0.003773	0.003575	0.006052	0.007707	0.00767	0.007679	0.007426	0.007187	0.004513	0.003241
Linear Smoothed	0.00%	0.14%	0.21%	0.28%	0.35%	0.42%	0.49%	0.47%	0.46%	0.45%	0.45%	0.44%	0.43%	0.42%	0.41%	0.40%	0.40%	0.39%	0.38%
Prior Sel	0.00%	0.47%	0.46%	0.45%	0.45%	0.44%	0.44%	0.43%	0.42%	0.42%	0.41%	0.41%	0.40%	0.39%	0.39%	0.38%	0.38%	0.37%	0.37%
Selected	0.00%	0.11%	0.24%	0.34%	0.42%	0.47%	0.50%	0.52%	0.53%	0.53%	0.53%	0.53%	0.53%	0.52%	0.51%	0.51%	0.50%	0.49%	0.48%
Active	0.00%	0.08%	0.17%	0.24%	0.29%	0.33%	0.35%	0.36%	0.37%	0.37%	0.37%	0.37%	0.37%	0.36%	0.36%	0.35%	0.35%	0.34%	0.33%
Inactive	0.00%	0.18%	0.39%	0.55%	0.67%	0.75%	0.80%	0.83%	0.84%	0.85%	0.85%	0.85%	0.84%	0.83%	0.82%	0.81%	0.80%	0.78%	0.76%
Phased Release	0.00%	0.21%	0.45%	0.64%	0.77%	0.87%	0.93%	0.96%	0.97%	0.98%	0.98%	0.98%	0.97%	0.96%	0.95%	0.94%	0.92%	0.90%	0.88%
X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Underground
Percent Forfeited

Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	3.45%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%
1981	0.00%	1.27%	0.00%	1.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1982	0.00%	0.00%	0.00%	4.35%	0.00%	0.00%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1983	2.38%	1.27%	0.00%	1.37%	0.00%	1.59%	0.00%	1.92%	0.00%	0.00%	0.00%	6.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1984	2.17%	0.00%	0.00%	2.44%	0.00%	0.00%	0.00%	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1985	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1986	0.00%	15.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1987	3.57%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%		
1988	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1989	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1990	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1991	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%						
1992	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1994	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1997	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1998	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1999	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
2000	0.00%	0.00%	0.00%	0.00%	0.00%															
2001	0.00%	0.00%	0.00%	0.00%																
2002	0.00%	0.00%	9.09%																	
2003	0.00%	0.00%																		
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2022																				
2023																				

Wtd Avg																				
5 Yr	0.00%	0.00%	1.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	0.00%	0.00%	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	0.00%	0.00%	0.51%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	0.33%	0.00%	0.34%	1.04%	0.00%	0.00%	0.00%	0.68%	0.00%	1.02%	0.00%	1.45%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	0.78%	0.98%	0.31%	1.16%	0.00%	0.20%	0.22%	0.49%	0.00%	1.17%	0.00%	1.38%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0.00325	0.003244	0.003772	0.005098	0.004278	0.00242	0.000352	0.001333	0.001167	0.004413	0.003432	0.005797	0.002366	0.002366	0.003261	0.003261	0.003261	0	0	0
Linear Smoothed	0.37%	0.36%	0.35%	0.35%	0.34%	0.33%	0.32%	0.31%	0.31%	0.30%	0.29%	0.28%	0.27%	0.26%	0.26%	0.25%	0.24%	0.23%	0.22%	0.21%
Prior Sel	0.36%	0.35%	0.35%	0.34%	0.34%	0.33%	0.32%	0.32%	0.31%	0.31%	0.30%	0.29%	0.29%	0.28%	0.28%	0.27%	0.26%	0.26%	0.25%	0.25%
Selected	0.46%	0.45%	0.44%	0.42%	0.41%	0.39%	0.37%	0.36%	0.34%	0.32%	0.30%	0.29%	0.29%	0.28%	0.27%	0.27%	0.26%	0.25%	0.25%	0.24%
Active	0.32%	0.32%	0.31%	0.29%	0.28%	0.27%	0.26%	0.25%	0.24%	0.22%	0.21%	0.21%	0.20%	0.20%	0.19%	0.19%	0.18%	0.18%	0.17%	0.17%
Inactive	0.74%	0.72%	0.70%	0.67%	0.65%	0.62%	0.60%	0.57%	0.54%	0.51%	0.48%	0.47%	0.46%	0.45%	0.44%	0.43%	0.41%	0.40%	0.39%	0.38%
Phased Release	0.86%	0.83%	0.81%	0.78%	0.75%	0.72%	0.69%	0.66%	0.63%	0.59%	0.56%	0.54%	0.53%	0.52%	0.50%	0.49%	0.48%	0.47%	0.46%	0.44%
X	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

Underground
Percent Forfeited

Issue Year	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
1980	0.00%	0.00%	0.00%	0.00%	0.00%															
1981	0.00%	3.33%	0.00%	0.00%																
1982	0.00%	0.00%	0.00%																	
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Wtd Avg																				
5 Yr	0.00%	1.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0	0.003187	0.003187	0.003187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linear Smoothed	0.21%	0.20%	0.19%	0.18%	0.17%	0.16%	0.16%	0.15%	0.14%	0.13%	0.12%	0.11%	0.11%	0.10%	0.09%	0.08%	0.07%	0.06%	0.06%	0.05%
Prior Sel	0.24%	0.23%	0.23%	0.22%	0.22%	0.21%	0.21%	0.20%	0.19%	0.19%	0.18%	0.18%	0.17%	0.16%	0.16%	0.15%	0.15%	0.14%		
Selected	0.23%	0.23%	0.22%	0.22%	0.21%	0.21%	0.20%	0.20%	0.19%	0.19%	0.18%	0.18%	0.17%	0.17%	0.16%	0.16%	0.16%	0.15%	0.15%	0.14%
Active	0.16%	0.16%	0.16%	0.15%	0.15%	0.14%	0.14%	0.14%	0.13%	0.13%	0.13%	0.12%	0.12%	0.12%	0.12%	0.11%	0.11%	0.11%	0.10%	0.10%
Inactive	0.37%	0.37%	0.36%	0.35%	0.34%	0.33%	0.32%	0.31%	0.31%	0.30%	0.29%	0.28%	0.28%	0.27%	0.26%	0.26%	0.25%	0.24%	0.24%	0.23%
Phased Release	0.43%	0.42%	0.41%	0.40%	0.39%	0.38%	0.37%	0.36%	0.35%	0.35%	0.34%	0.33%	0.32%	0.31%	0.30%	0.30%	0.29%	0.28%	0.27%	0.27%
X	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59

Underground 0.000559
Percent Released

Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	0.00%	0.00%	0.00%	3.13%	0.00%	0.00%	21.43%	10.53%	12.50%	0.00%	21.43%	0.00%	9.09%	0.00%	11.11%	0.00%	0.00%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.30%	20.00%	5.45%	14.29%	7.32%	0.00%	5.26%	5.71%	0.00%	3.13%	0.00%	3.57%	3.85%
1979	0.00%	1.41%	0.00%	0.00%	0.00%	4.76%	13.79%	6.38%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.86%	0.00%	2.94%	3.03%	6.25%
1980	0.00%	0.00%	0.00%	0.00%	6.60%	7.61%	3.85%	4.17%	2.99%	6.15%	1.64%	0.00%	1.67%	1.69%	1.75%	3.57%	11.32%	2.17%	4.44%
1981	0.00%	0.00%	0.00%	1.69%	5.81%	2.55%	0.67%	4.05%	2.82%	0.72%	2.21%	0.75%	0.76%	0.78%	0.00%	7.26%	9.73%	8.08%	6.67%
1982	0.00%	0.00%	1.96%	2.00%	3.09%	3.23%	4.44%	2.33%	1.19%	1.20%	4.88%	1.28%	1.30%	4.05%	15.94%	16.67%	15.91%	5.56%	11.76%
1983	0.00%	0.33%	5.28%	2.10%	5.80%	8.20%	5.17%	1.37%	4.21%	6.37%	5.95%	1.74%	4.91%	7.33%	4.48%	6.35%	6.78%	9.26%	10.53%
1984	0.00%	0.52%	1.60%	3.31%	5.85%	11.84%	1.53%	3.23%	5.04%	2.68%	4.72%	5.05%	1.11%	9.09%	2.60%	20.55%	5.17%	14.55%	0.00%
1985	0.00%	3.33%	1.15%	6.02%	3.85%	2.78%	4.55%	0.00%	0.00%	1.72%	8.77%	12.24%	11.90%	0.00%	5.88%	6.25%	7.14%	8.00%	13.04%
1986	0.00%	1.04%	2.11%	2.22%	2.30%	2.38%	2.47%	1.28%	1.32%	1.35%	13.04%	10.53%	10.20%	13.64%	18.42%	16.67%	0.00%	4.17%	9.09%
1987	0.93%	1.87%	0.96%	2.97%	2.08%	4.26%	1.12%	1.14%	5.95%	3.95%	7.04%	3.08%	8.20%	21.43%	7.32%	8.33%	9.09%	3.45%	0.00%
1988	2.29%	2.29%	1.76%	3.07%	9.62%	3.60%	6.35%	6.09%	7.22%	3.45%	7.23%	7.04%	13.85%	13.46%	13.64%	7.89%	3.03%	6.45%	0.00%
1989	0.00%	0.00%	3.13%	7.26%	2.68%	8.57%	4.35%	10.47%	6.49%	4.35%	10.77%	12.50%	6.38%	4.76%	10.26%	0.00%	3.13%	6.45%	10.71%
1990	0.00%	1.92%	2.00%	0.00%	6.38%	4.65%	0.00%	0.00%	13.16%	3.13%	9.68%	7.41%	0.00%	8.33%	18.18%	5.56%	5.88%	0.00%	6.25%
1991	0.00%	2.13%	2.33%	0.00%	4.88%	0.00%	5.41%	0.00%	0.00%	9.68%	10.71%	0.00%	16.00%	4.76%	5.00%	0.00%	0.00%	0.00%	5.26%
1992	0.00%	0.00%	0.00%	2.04%	0.00%	0.00%	2.27%	0.00%	2.38%	14.63%	5.71%	0.00%	0.00%	9.68%	0.00%	7.14%	3.85%	4.00%	8.33%
1993	0.00%	5.36%	1.89%	2.17%	2.22%	2.38%	2.50%	0.00%	2.56%	0.00%	2.70%	8.57%	6.25%	0.00%	3.33%	10.34%	3.85%	0.00%	4.00%
1994	0.00%	0.00%	0.00%	0.00%	3.70%	5.88%	2.08%	4.26%	0.00%	2.22%	2.27%	9.30%	2.56%	5.26%	5.56%	2.94%	6.06%	3.23%	3.33%
1995	2.33%	0.00%	2.33%	2.44%	2.50%	5.26%	0.00%	5.71%	0.00%	3.03%	0.00%	6.25%	6.67%	10.71%	0.00%	0.00%	12.50%	0.00%	0.00%
1996	0.00%	2.22%	0.00%	0.00%	4.55%	7.50%	0.00%	2.70%	0.00%	5.56%	0.00%	5.88%	3.23%	3.33%	0.00%	3.45%	3.57%	0.00%	3.70%
1997	0.00%	2.33%	0.00%	0.00%	2.38%	0.00%	4.88%	2.63%	0.00%	0.00%	10.81%	3.03%	3.13%	0.00%	6.45%	0.00%	0.00%	0.00%	0.00%
1998	0.00%	0.00%	0.00%	0.00%	8.11%	2.94%	6.25%	3.33%	0.00%	3.45%	10.71%	0.00%	0.00%	4.17%	0.00%	4.35%	13.64%	0.00%	0.00%
1999	0.00%	0.00%	2.86%	0.00%	0.00%	6.06%	0.00%	0.00%	0.00%	0.00%	3.23%	3.33%	0.00%	0.00%	0.00%	3.45%	3.57%	11.11%	4.17%
2000	0.00%	0.00%	0.00%	0.00%	3.23%	0.00%	0.00%	10.00%	0.00%	0.00%	3.70%	3.85%	0.00%	4.00%	0.00%	0.00%	4.17%	13.04%	5.00%
2001	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%
2002	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	8.33%	0.00%	9.09%	0.00%	5.00%	0.00%	5.26%	11.11%	0.00%	6.25%	13.33%
2003	0.00%	0.00%	0.00%	0.00%	3.33%	3.45%	0.00%	0.00%	7.14%	0.00%	3.85%	4.00%	0.00%	4.17%	0.00%	4.35%	0.00%	0.00%	9.09%
2004	0.00%	4.35%	4.55%	0.00%	9.52%	0.00%	0.00%	5.26%	0.00%	11.11%	6.25%	0.00%	0.00%	0.00%	13.33%	0.00%	7.69%	0.00%	0.00%
2005	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	0.00%	5.88%	6.25%	0.00%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	7.14%	0.00%
2006	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	
2007	0.00%	0.00%	0.00%	0.00%	4.55%	0.00%	0.00%	0.00%	4.76%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	6.25%	0.00%		
2008	0.00%	0.00%	14.29%	0.00%	5.56%	5.88%	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	6.67%	0.00%	7.14%			
2009	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.53%	0.00%	0.00%	0.00%	0.00%	0.00%	5.88%				
2010	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	8.33%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
2011	0.00%	0.00%	5.56%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%						
2012	0.00%	0.00%	11.76%	6.67%	7.14%	23.08%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%							
2013	0.00%	5.26%	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%								
2014	0.00%	0.00%	0.00%	17.24%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%									
2015	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
2016	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%											
2017	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
2018	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
2019	0.00%	0.00%	0.00%	0.00%	0.00%														
2020	0.00%	0.00%	0.00%	0.00%															
2021	0.00%	0.00%	0.00%																
2022	0.00%	0.00%																	
2023	0.00%																		
Wtd Avg																			
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	1.35%	0.00%	2.53%	0.00%	0.00%	2.38%	1.30%	2.74%	1.25%	2.50%	5.41%
10 Yr	0.00%	2.04%	1.83%	5.98%	1.57%	2.86%	2.04%	1.27%	2.38%	1.16%	4.29%	1.21%	0.57%	2.31%	2.30%	3.28%	5.38%	4.21%	3.63%
15 Yr	0.00%	1.01%	2.79%	4.05%	1.79%	2.56%	1.59%	1.14%	3.30%	1.41%	4.20%	1.77%	0.67%	2.24%	1.93%	2.80%	5.21%	3.13%	3.85%
All Yr	0.24%	0.90%	1.75%	2.19%	4.04%	4.68%	3.51%	3.50%	3.81%	3.57%	5.67%	3.73%	4.03%	5.48%	4.88%	6.67%	6.31%	5.39%	5.51%
All Avg Rolling	0.00235	0.005228525	0.008802	0.018795659	0.021679	0.02645	0.022211	0.020956	0.019905	0.019075	0.028068	0.024624	0.023901	0.020334	0.023417	0.03192	0.036702	0.040725	0.043148
Linear Smoothed	0.90%	1.05%	1.20%	1.36%	1.51%	1.66%	1.81%	1.97%	2.12%	2.27%	2.42%	2.58%	2.73%	2.88%	3.03%	3.19%	3.34%	3.49%	4.13%
Prior Sel	1.37%	1.55%	1.73%	1.91%	2.08%	2.26%	2.44%	2.62%	2.79%	2.97%	3.15%	3.33%	3.50%	3.68%	3.86%	4.04%	4.21%	4.39%	4.77%
Selected	0.50%	0.81%	1.10%	1.37%	1.62%	1.85%	2.06%	2.26%	2.44%	2.60%	2.75%	2.88%	2.99%	3.09%	3.18%	3.25%	3.31%	3.35%	3.38%
Active	0.42%	0.69%	0.93%	1.16%	1.38%	1.57%	1.75%	1.92%	2.07%	2.21%	2.33%	2.45%	2.54%	2.63%	2.70%	2.76%	2.81%	2.85%	2.88%
Inactive	0.25%	0.40%	0.55%	0.68%	0.81%	0.92%	1.03%	1.13%	1.22%	1.30%	1.37%	1.44%	1.50%	1.55%	1.59%	1.62%	1.65%	1.68%	1.69%
Phased Release	1.14%	1.86%	2.52%	3.14%	3.72%	4.25%	4.75%	5.20%	5.61%	5.98%	6.32%	6.62%	6.88%	7.11%	7.31%	7.47%	7.60%	7.71%	7.78%

Underground
Percent Released

Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	12.50%	14.29%	16.67%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	12.50%	4.76%	5.00%	21.05%	6.67%	14.29%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	11.11%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	0.00%	3.57%	0.00%	16.00%	0.00%	9.52%	0.00%	5.26%	0.00%	5.56%	5.88%	6.25%	0.00%	7.14%	15.38%	9.09%	0.00%	0.00%	0.00%	0.00%
1980	4.76%	10.00%	5.56%	11.76%	13.33%	3.85%	28.00%	16.67%	6.67%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%
1981	4.82%	15.19%	7.58%	8.20%	9.09%	10.00%	0.00%	6.67%	9.52%	0.00%	5.26%	0.00%	2.78%	0.00%	11.43%	0.00%	3.23%	0.00%	0.00%	0.00%
1982	17.24%	4.17%	0.00%	4.35%	14.29%	11.11%	0.00%	6.25%	0.00%	0.00%	7.14%	7.69%	0.00%	8.33%	9.09%	0.00%	0.00%	0.00%	10.00%	11.11%
1983	2.38%	3.80%	2.67%	5.48%	7.35%	4.76%	11.86%	0.00%	0.00%	3.92%	0.00%	4.08%	0.00%	0.00%	0.00%	0.00%	0.00%	2.27%	2.33%	2.38%
1984	8.70%	0.00%	0.00%	4.88%	10.53%	5.88%	3.13%	0.00%	6.67%	3.57%	11.11%	0.00%	4.17%	4.35%	0.00%	9.09%	0.00%	5.00%	0.00%	0.00%
1985	0.00%	0.00%	5.26%	11.76%	13.33%	15.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	11.11%	0.00%	12.50%	0.00%	0.00%	0.00%
1986	5.00%	5.26%	0.00%	6.67%	14.29%	16.67%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1987	3.57%	15.38%	9.09%	15.00%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	13.33%	7.69%	8.33%	0.00%	0.00%	0.00%	0.00%	10.00%		
1988	7.14%	3.85%	0.00%	0.00%	4.17%	4.35%	9.09%	5.00%	0.00%	0.00%	0.00%	5.26%	0.00%	5.56%	0.00%	0.00%	0.00%			
1989	0.00%	8.00%	8.70%	0.00%	4.76%	5.00%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	5.56%	5.88%	0.00%				
1990	13.33%	0.00%	7.69%	0.00%	8.33%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1991	0.00%	5.88%	12.50%	0.00%	0.00%	0.00%	0.00%	7.14%	7.69%	0.00%	0.00%	18.18%	0.00%	0.00%						
1992	0.00%	0.00%	4.55%	0.00%	4.76%	5.26%	5.56%	5.88%	0.00%	6.25%	0.00%	0.00%	0.00%							
1993	4.17%	17.39%	0.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%								
1994	6.90%	3.70%	3.85%	0.00%	0.00%	29.17%	0.00%	0.00%	0.00%	5.88%	0.00%									
1995	4.76%	0.00%	0.00%	0.00%	5.00%	5.26%	0.00%	5.56%	5.88%	6.25%										
1996	8.00%	0.00%	13.04%	10.00%	0.00%	0.00%	5.56%	0.00%	0.00%											
1997	0.00%	3.45%	3.57%	3.70%	0.00%	3.85%	8.00%	0.00%												
1998	5.26%	5.56%	5.88%	0.00%	0.00%	0.00%	6.25%													
1999	0.00%	8.70%	4.76%	0.00%	0.00%	0.00%														
2000	0.00%	0.00%	5.26%	0.00%	0.00%															
2001	8.33%	0.00%	0.00%	0.00%																
2002	15.38%	0.00%	0.00%																	
2003	0.00%	10.00%																		
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5 Yr	5.26%	4.76%	3.80%	1.09%	0.00%	2.02%	4.26%	1.08%	1.18%	3.80%	0.00%	2.78%	0.00%	3.03%	1.56%	0.00%	1.56%	3.33%	2.27%	1.87%
10 Yr	4.15%	3.48%	4.10%	1.52%	1.02%	5.38%	4.00%	2.31%	1.24%	1.99%	2.11%	2.72%	1.18%	3.05%	3.78%	1.12%	1.18%	2.53%	1.36%	1.46%
15 Yr	4.32%	4.65%	4.76%	2.08%	2.47%	5.93%	4.14%	1.71%	1.44%	2.04%	3.17%	3.64%	1.59%	2.55%	4.52%	1.51%	1.11%	2.48%	1.35%	1.46%
All Yr	4.95%	6.04%	4.35%	5.46%	5.79%	6.57%	5.80%	3.20%	2.45%	2.05%	3.48%	3.81%	1.95%	2.54%	4.52%	1.51%	1.11%	2.48%	1.35%	1.46%
All Avg Rolling	0.043582	0.046665	0.045517	0.038412	0.030366	0.032772	0.039476	0.03866	0.027337	0.020402	0.020786	0.026313	0.022023	0.024033	0.025245	0.024758	0.01958	0.016611	0.018443	0.019516
Linear Smoothed	4.02%	3.91%	3.80%	3.70%	3.59%	3.48%	3.37%	3.27%	3.16%	3.05%	2.94%	2.84%	2.73%	2.62%	2.51%	2.40%	2.30%	2.19%	2.08%	1.97%
Prior Sel	4.65%	4.53%	4.41%	4.29%	4.17%	4.05%	3.93%	3.81%	3.69%	3.57%	3.46%	3.34%	3.22%	3.10%	2.98%	2.86%	2.74%	2.62%	2.50%	2.38%
Selected	3.40%	3.41%	3.41%	3.40%	3.37%	3.34%	3.30%	3.25%	3.19%	3.12%	3.05%	2.97%	2.88%	2.79%	2.69%	2.59%	2.48%	2.37%	2.25%	2.14%
Active	2.89%	2.90%	2.90%	2.89%	2.87%	2.84%	2.80%	2.76%	2.71%	2.65%	2.59%	2.52%	2.45%	2.37%	2.29%	2.20%	2.11%	2.01%	1.92%	1.82%
Inactive	1.70%	1.71%	1.70%	1.70%	1.69%	1.67%	1.65%	1.62%	1.59%	1.56%	1.52%	1.48%	1.44%	1.39%	1.35%	1.29%	1.24%	1.18%	1.13%	1.07%
Phased Release	7.83%	7.85%	7.84%	7.81%	7.76%	7.68%	7.59%	7.47%	7.34%	7.18%	7.01%	6.83%	6.63%	6.41%	6.19%	5.95%	5.70%	5.45%	5.18%	4.91%

Underground
Percent Released

Issue Year	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1977	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	100.00%												
1978	14.29%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%													
1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
1980	0.00%	0.00%	0.00%	0.00%	0.00%															
1981	0.00%	0.00%	0.00%	6.90%																
1982	0.00%	12.50%	0.00%																	
1983	2.44%	0.00%																		
1984	5.26%																			
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Wtd Avg																				
5 Yr	1.85%	1.02%	0.00%	3.57%	0.00%	5.56%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	2.34%	0.93%	1.54%	3.51%	0.00%	5.56%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	2.34%	0.93%	1.54%	3.51%	0.00%	5.56%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	2.34%	0.93%	1.54%	3.51%	0.00%	5.56%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0.01789	0.015797	0.014436	0.018781	0.015594	0.030267	0.018519	0.035185	0.016667	0.016667	0	0	0	0	0	0	0	0	0	0
Linear Smoothed	1.87%	1.76%	1.65%	1.54%	1.43%	1.33%	1.22%	1.11%	1.00%	0.90%	0.79%	0.68%	0.57%	0.46%	0.36%	0.25%	0.14%	0.03%	0.00%	0.00%
Prior Sel	2.26%	2.15%	2.03%	1.91%	1.79%	1.67%	1.55%	1.43%	1.31%	1.19%	1.07%	0.95%	0.83%	0.72%	0.60%	0.48%	0.36%	0.24%		
Selected	2.02%	1.89%	1.77%	1.64%	1.52%	1.39%	1.27%	1.14%	1.10%	1.05%	1.01%	0.97%	0.93%	0.89%	0.86%	0.82%	0.79%	0.76%	0.73%	0.70%
Active	1.71%	1.61%	1.50%	1.40%	1.29%	1.18%	1.08%	0.97%	0.93%	0.89%	0.86%	0.82%	0.79%	0.76%	0.73%	0.70%	0.67%	0.64%	0.62%	0.59%
Inactive	1.01%	0.95%	0.88%	0.82%	0.76%	0.70%	0.63%	0.57%	0.55%	0.53%	0.50%	0.48%	0.47%	0.45%	0.43%	0.41%	0.40%	0.38%	0.36%	0.35%
Phased Release	4.63%	4.35%	4.07%	3.78%	3.49%	3.20%	2.91%	2.63%	2.52%	2.42%	2.32%	2.23%	2.14%	2.05%	1.97%	1.89%	1.82%	1.75%	1.68%	1.61%

Other
Total Permits

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1969	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1970	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1971	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3
1972	7	7	7	7	7	7	7	6	6	6	6	6	5	4	4	4	4	4	4
1973	7	7	7	7	7	7	7	7	7	7	7	6	5	5	5	5	5	4	4
1974	16	16	16	14	14	14	13	13	13	13	11	8	7	7	6	5	5	5	4
1975	26	26	25	24	24	24	23	23	23	19	13	12	6	5	4	4	4	4	4
1976	23	23	22	22	22	22	22	21	19	14	11	9	9	7	7	7	7	7	7
1977	23	23	21	20	20	19	19	16	15	11	11	11	11	11	11	11	11	10	10
1978	25	23	22	17	17	17	16	12	11	10	10	10	10	10	10	10	9	9	9
1979	21	21	20	19	19	17	15	13	12	12	11	11	11	11	11	11	11	8	7
1980	38	37	35	34	33	31	27	24	23	23	23	23	22	22	22	21	19	19	19
1981	123	123	123	121	117	116	114	113	113	113	110	110	106	105	102	99	96	92	91
1982	70	69	65	62	61	57	56	53	50	50	46	45	41	39	34	31	29	28	23
1983	220	215	208	198	181	167	161	159	156	144	136	119	113	110	101	97	96	89	83
1984	133	131	124	117	112	104	101	99	95	90	79	77	74	69	65	64	58	57	53
1985	78	77	71	67	65	62	62	57	49	46	38	37	33	32	31	27	26	24	24
1986	80	73	67	64	62	60	51	44	37	33	31	28	21	21	21	21	21	21	21
1987	89	83	78	71	67	54	44	38	31	26	21	19	18	16	16	16	16	16	16
1988	123	116	110	107	94	73	59	42	34	34	28	23	21	19	17	15	15	14	14
1989	137	130	127	103	79	61	45	31	29	27	24	20	19	17	14	14	14	14	14
1990	148	143	102	66	40	20	13	12	11	11	11	10	10	10	10	9	9	8	8
1991	199	159	104	67	41	24	23	19	17	17	17	16	16	16	15	14	14	11	11
1992	170	131	98	57	38	33	25	25	22	22	21	20	20	20	19	19	17	17	17
1993	169	146	91	49	39	34	29	27	27	24	23	23	21	20	19	19	19	17	16
1994	114	83	48	33	27	23	22	22	21	20	20	20	19	18	18	18	16	16	16
1995	150	118	65	38	22	15	15	13	13	13	13	12	11	11	11	11	10	10	10
1996	130	86	53	27	17	9	9	9	8	8	6	6	6	5	5	5	4	4	4
1997	162	129	82	50	34	31	30	25	20	20	19	19	19	18	18	16	15	15	15
1998	162	112	59	33	19	17	12	11	8	8	7	7	7	7	7	7	7	7	6
1999	140	110	68	45	33	19	14	8	8	7	7	7	7	7	7	7	7	7	6
2000	117	94	66	38	23	15	11	9	7	5	5	5	5	4	3	3	3	3	3
2001	125	91	66	35	23	17	13	9	8	7	7	7	7	7	7	7	7	6	6
2002	110	96	57	37	24	20	14	12	11	11	10	9	9	9	9	9	8	8	8
2003	80	65	47	24	18	10	9	9	9	9	8	8	7	7	7	7	6	6	6
2004	127	99	76	36	20	14	14	12	12	12	12	12	12	12	12	9	9	9	9
2005	128	115	69	30	19	13	10	8	5	5	5	4	3	3	3	3	3	3	3
2006	198	166	86	30	22	19	12	10	10	9	9	8	7	7	7	7	7	7	
2007	183	139	80	41	28	18	13	9	9	9	9	7	6	6	6	6	6		
2008	191	161	102	49	27	17	14	13	12	11	11	10	10	10	9	8			
2009	176	140	79	41	20	12	11	10	9	8	7	7	6	5	5				
2010	143	124	63	32	23	20	16	13	13	11	9	9	9	9					
2011	171	157	96	45	32	18	14	8	5	4	4	4	4						
2012	162	141	75	46	31	26	17	13	8	8	8	8							
2013	132	107	72	40	32	22	21	20	18	18	18								
2014	84	67	34	23	14	10	8	8	8	8									
2015	67	52	33	17	11	10	10	10	10										
2016	30	24	14	9	8	6	6	6											
2017	43	37	17	9	7	6	6												
2018	57	42	19	5	4	3													
2019	62	47	18	7	5														
2020	58	40	9	6															
2021	35	31	16																
2022	38	35																	
2023	55																		

Other
Total Permits

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
1969	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1971	3	3	3	3	3	3	3	2	2	2	2	2	2	0	0	0	0	0	0	0
1972	4	4	4	4	4	4	3	2	2	1	1	1	1	1	1	1	1	1	1	1
1973	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1974	4	4	4	4	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
1975	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
1976	7	7	7	6	6	6	6	6	6	5	5	5	5	4	4	4	4	4	4	4
1977	9	9	7	6	6	6	5	4	4	4	4	4	4	4	4	4	4	4	4	4
1978	8	6	6	6	4	4	3	3	3	3	3	3	3	3	3	3	3	2	2	2
1979	7	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1980	19	19	19	18	17	17	16	16	16	16	16	15	15	15	12	11	11	11	11	11
1981	88	83	81	77	75	72	69	69	68	68	66	65	65	63	62	61	60	59	59	58
1982	21	20	20	20	19	19	18	17	17	17	17	16	15	15	14	11	11	11	10	9
1983	80	76	74	73	69	67	63	61	59	58	57	56	56	55	55	53	51	50	48	46
1984	52	51	50	50	49	49	49	49	48	48	47	47	46	44	44	44	44	44	43	43
1985	23	23	23	22	22	22	22	21	21	20	20	19	19	19	19	18	18	18	18	18
1986	20	20	18	18	18	18	18	18	18	17	17	17	16	14	14	13	13	13	13	
1987	16	15	15	14	13	13	13	13	13	12	12	12	12	11	10	9	8	7		
1988	14	13	13	13	12	12	10	10	10	10	10	10	10	10	10	10	10			
1989	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14				
1990	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8					
1991	10	10	9	9	9	8	8	8	8	8	7	7	6	6						
1992	16	16	16	16	16	16	16	16	15	14	14	14	13							
1993	16	15	15	15	14	14	14	14	14	14	13	13								
1994	16	16	16	16	16	16	16	16	16	16	15									
1995	10	10	10	10	10	10	10	10	9	9										
1996	4	4	4	4	4	4	4	4	4											
1997	15	14	14	14	14	14	13	13												
1998	6	6	6	6	6	6	6													
1999	6	6	6	6	6	6														
2000	3	3	3	3	2															
2001	6	6	6	6																
2002	8	8	8																	
2003	6	6																		
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Other
Total Permits

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	1	1	1	1	1	1	1	1	1	1	1	1	1							
1973	3	3	2	2	2	2	1	1	1	1	1	1								
1974	1	1	1	1	1	1	1	1	1	1	1									
1975	2	2	2	2	1	1	1	1	1	1										
1976	4	4	4	4	4	4	4	3	3											
1977	4	4	4	4	4	4	4	4												
1978	2	1	1	1	1	1	1													
1979	5	5	5	4	4	4														
1980	11	10	9	9	9															
1981	54	52	51	48																
1982	9	9	9																	
1983	46	46																		
1984	42																			
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Other
Total Releases

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
1974	0	0	0	0	0	0	0	0	0	0	2	3	1	0	1	1	0	0	1
1975	0	0	0	0	0	0	0	0	0	4	5	1	5	1	1	0	0	0	0
1976	0	0	0	0	0	0	0	0	1	5	3	2	0	2	0	0	0	0	0
1977	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	1	0
1978	0	0	0	0	0	0	1	4	1	1	0	0	0	0	0	0	1	0	0
1979	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	3	1
1980	0	0	0	0	1	2	2	3	0	0	0	0	1	0	0	1	2	0	0
1981	0	0	0	2	1	1	2	1	0	0	3	0	4	0	1	1	3	4	1
1982	0	0	1	0	1	2	1	1	2	0	4	0	1	2	3	3	1	1	3
1983	0	4	4	8	12	12	4	1	2	9	5	13	3	1	9	3	1	4	4
1984	0	2	2	5	5	7	2	1	4	4	7	2	2	2	3	1	4	1	4
1985	0	0	3	2	2	2	0	5	5	3	6	1	4	0	1	2	0	2	0
1986	0	2	2	2	0	2	7	5	5	3	2	2	5	0	0	0	0	0	0
1987	0	2	5	4	3	11	7	6	6	4	4	2	1	1	0	0	0	0	0
1988	2	5	4	3	12	19	9	17	7	0	5	5	1	1	2	1	0	1	0
1989	0	1	0	24	24	16	13	12	2	2	3	1	1	2	1	0	0	0	0
1990	0	2	40	33	23	19	7	1	1	0	0	1	0	0	0	1	0	1	0
1991	0	40	55	36	25	15	1	4	1	0	0	1	0	0	1	1	0	0	0
1992	2	39	33	37	18	4	8	0	3	0	1	1	0	0	1	0	2	0	0
1993	2	23	49	41	10	5	5	1	0	3	1	0	2	1	1	0	0	2	1
1994	3	31	35	14	6	4	1	0	1	0	0	0	1	1	0	0	1	0	0
1995	6	32	52	27	16	7	0	2	0	0	0	1	1	0	0	0	1	0	0
1996	4	44	33	25	10	8	0	0	0	0	2	0	0	0	0	0	1	0	0
1997	6	33	47	31	16	3	1	5	5	0	1	0	0	1	0	1	1	0	0
1998	12	50	53	25	13	2	3	1	3	0	1	0	0	0	0	0	0	0	1
1999	15	30	42	23	12	13	5	6	0	1	0	0	0	0	0	0	0	0	1
2000	4	23	28	27	15	8	4	2	1	2	0	0	0	0	0	0	0	0	0
2001	6	34	25	31	11	4	4	4	1	0	0	0	0	0	0	0	0	1	0
2002	6	14	38	20	13	4	6	2	1	0	1	1	0	0	0	0	0	0	0
2003	3	15	18	23	6	8	0	0	0	0	1	0	0	0	0	0	1	0	0
2004	9	28	23	40	16	6	0	2	0	0	0	0	0	0	0	2	0	0	0
2005	6	13	45	39	11	6	3	2	3	0	0	1	1	0	0	0	0	0	0
2006	6	32	80	55	8	3	7	2	0	1	0	1	1	0	0	0	0	0	
2007	8	44	59	39	13	10	4	3	0	0	0	2	0	0	0	0	0		
2008	4	29	59	52	22	9	3	1	1	1	0	0	0	0	0	1			
2009	5	36	61	38	20	8	0	1	1	0	0	0	1	1	0				
2010	4	19	61	31	9	3	4	3	0	1	2	0	0	0					
2011	1	14	61	51	13	14	4	6	1	1	0	0	0						
2012	0	21	66	29	15	5	9	2	4	0	0	0							
2013	3	25	35	32	8	10	1	0	2	0	0								
2014	3	17	33	11	9	4	2	0	0	0									
2015	3	15	19	16	5	1	0	0	0										
2016	2	6	10	5	1	2	0	0											
2017	3	6	20	8	2	1	0												
2018	1	15	23	14	1	1													
2019	4	15	29	11	2														
2020	0	18	31	3															
2021	2	4	15																
2022	0	3																	
2023	0																		

Other
Total Releases

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1969	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1975	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1976	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1977	1	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	1	2	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
1979	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	1	1	0	1	0	0	0	0	1	0	0	3	1	0	0	0	0
1981	2	4	2	4	1	1	3	0	1	0	2	1	0	1	1	1	1	1	0	1
1982	2	1	0	0	1	0	1	1	0	0	0	1	0	0	1	3	0	0	1	1
1983	3	4	2	1	4	2	4	2	0	1	1	1	0	1	0	2	2	1	1	2
1984	1	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
1985	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
1986	1	0	2	0	0	0	0	0	0	1	0	0	1	2	0	1	0	0	0	
1987	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1		
1988	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	1	0	1	0	0	1	0	0	0	0	1	0	1	0						
1992	1	0	0	0	0	0	0	0	1	1	0	0	1							
1993	0	1	0	0	1	0	0	0	0	0	1	0								
1994	0	0	0	0	0	0	0	0	0	0	1									
1995	0	0	0	0	0	0	0	0	1	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	1	0	0	0	0	1	0												
1998	0	0	0	0	0	0	0													
1999	0	0	0	0	0	0														
2000	0	0	0	0	1															
2001	0	0	0	0																
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Other
Total Releases

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	1	0	0	0	1	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	1	0	0	0	0	0										
1976	0	0	0	0	0	0	0	1	0											
1977	0	0	0	0	0	0	0	0												
1978	0	1	0	0	0	0	0													
1979	0	0	0	1	0	0														
1980	0	1	1	0	0															
1981	3	0	1	3																
1982	0	0	0																	
1983	0	0																		
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2023																				

Other
Total Forfeitures

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	1	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
1976	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
1977	0	0	2	1	0	1	0	2	0	1	0	0	0	0	0	0	0	0	0
1978	0	2	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	1	1	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0
1980	0	1	2	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	3	0	0	0	0	0	0	0	0	1	2	2	0	0	0
1982	0	1	3	3	0	2	0	2	1	0	0	1	3	0	2	0	1	0	2
1983	0	1	3	2	5	2	2	1	1	3	3	4	3	2	0	1	0	3	2
1984	0	0	5	2	0	1	1	1	0	1	4	0	1	3	1	0	2	0	0
1985	0	1	3	2	0	1	0	0	3	0	2	0	0	1	0	2	1	0	0
1986	1	5	4	1	2	0	2	2	2	1	0	1	2	0	0	0	0	0	0
1987	0	4	0	3	1	2	3	0	1	1	1	0	0	1	0	0	0	0	0
1988	1	2	2	0	1	2	5	0	1	0	1	0	1	1	0	1	0	0	0
1989	1	6	3	0	0	2	3	2	0	0	0	3	0	0	2	0	0	0	0
1990	0	3	1	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	1	1	2	0	0	1	0	0	0	0	0	0	0	0	3	0
1992	0	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	6	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
1995	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
1997	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
2001	0	0	0	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0
2002	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2003	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
2005	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0		
2008	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0			
2009	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0				
2010	0	0	0	0	0	0	0	0	0	1	0	0	0	0					
2011	0	0	0	0	0	0	0	0	2	0	0	0	0						
2012	0	0	0	0	0	0	0	2	1	0	0	0							
2013	0	0	0	0	0	0	0	1	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	1	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Other
Total Forfeitures

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	1	1	0	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0
1984	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0
1985	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0		
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1992	0	0	0	0	0	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	0	0	0	0	0	0	0	0									
1995	0	0	0	0	0	0	0	0	0	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
1998	0	0	0	0	0	0	0													
1999	0	0	0	0	0	0														
2000	0	0	0	0	0															
2001	0	0	0	0																
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2023																				

Other
Total Forfeitures

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
1977	0	0	0	0	0	0	0	0												
1978	0	0	0	0	0	0	0													
1979	0	0	0	0	0	0														
1980	0	0	0	0	0															
1981	1	2	0	0																
1982	0	0	0																	
1983	0	0																		
1984	0																			
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Other
Misc Terminations

Issue Yr	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2011	0	0	0	0	0	0	0	0	0	0	0	0	0						
2012	0	0	0	0	0	0	0	0	0	0	0	0							
2013	0	0	0	0	0	0	0	0	0	0	0								
2014	0	0	0	0	0	0	0	0	0	0									
2015	0	0	0	0	0	0	0	0	0										
2016	0	0	0	0	0	0	0	0											
2017	0	0	0	0	0	0	0												
2018	0	0	0	0	0	0													
2019	0	0	0	0	0														
2020	0	0	0	0															
2021	0	0	0																
2022	0	0																	
2023	0																		

Other
Misc Terminations

Issue Yr	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1992	0	0	0	0	0	0	0	0	0	0	0	0	0							
1993	0	0	0	0	0	0	0	0	0	0	0	0								
1994	0	0	0	0	0	0	0	0	0	0	0									
1995	0	0	0	0	0	0	0	0	0	0										
1996	0	0	0	0	0	0	0	0	0											
1997	0	0	0	0	0	0	0	0												
1998	0	0	0	0	0	0	0													
1999	0	0	0	0	0	0														
2000	0	0	0	0	0															
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Other
Misc Terminations

Issue Yr	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1972	0	0	0	0	0	0	0	0	0	0	0	0	0							
1973	0	0	0	0	0	0	0	0	0	0	0	0								
1974	0	0	0	0	0	0	0	0	0	0	0									
1975	0	0	0	0	0	0	0	0	0	0										
1976	0	0	0	0	0	0	0	0	0											
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Other
Percent Forfeited

Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	3.85%	4.00%	0.00%	0.00%	4.17%	0.00%	0.00%	0.00%	5.26%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	4.35%	0.00%	0.00%	0.00%	0.00%	4.55%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	8.70%	4.76%	0.00%	5.00%	0.00%	10.53%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	0.00%	8.00%	4.35%	22.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	0.00%	0.00%	4.76%	5.00%	0.00%	5.26%	5.88%	6.67%	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00%	2.63%	5.41%	2.86%	0.00%	0.00%	6.45%	0.00%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1981	0.00%	0.00%	0.00%	0.00%	2.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%	1.90%	1.96%	0.00%	0.00%	0.00%
1982	0.00%	1.43%	4.35%	4.62%	0.00%	3.28%	0.00%	3.57%	1.89%	0.00%	0.00%	2.17%	6.67%	0.00%	5.13%	0.00%	3.23%	0.00%	7.14%
1983	0.00%	0.45%	1.40%	0.96%	2.53%	1.10%	1.20%	0.62%	0.63%	1.92%	2.08%	2.94%	2.52%	1.77%	0.00%	0.99%	0.00%	3.13%	2.25%
1984	0.00%	0.00%	3.82%	1.61%	0.00%	0.89%	0.96%	0.99%	0.00%	1.05%	4.44%	0.00%	1.30%	4.05%	1.45%	0.00%	3.13%	0.00%	0.00%
1985	0.00%	1.28%	3.90%	2.82%	0.00%	1.54%	0.00%	0.00%	5.26%	0.00%	4.35%	0.00%	0.00%	3.03%	0.00%	6.45%	3.70%	0.00%	0.00%
1986	1.25%	6.25%	5.48%	1.49%	3.13%	0.00%	3.33%	3.92%	4.55%	2.70%	0.00%	3.23%	7.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1987	0.00%	4.49%	0.00%	3.85%	1.41%	2.99%	5.56%	0.00%	2.63%	3.23%	3.85%	0.00%	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%
1988	0.81%	1.63%	1.72%	0.00%	0.93%	2.13%	6.85%	0.00%	2.38%	0.00%	2.94%	0.00%	4.35%	4.76%	0.00%	5.88%	0.00%	0.00%	0.00%
1989	0.73%	4.38%	2.31%	0.00%	0.00%	2.53%	4.92%	4.44%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	11.76%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	2.03%	0.70%	2.94%	4.55%	2.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1991	0.00%	0.00%	0.00%	0.96%	1.49%	4.88%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.43%	0.00%
1992	0.00%	0.00%	0.00%	4.08%	1.75%	2.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1993	0.00%	0.00%	4.11%	1.10%	0.00%	0.00%	0.00%	3.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1994	0.00%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	0.00%
1995	0.00%	0.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%
1997	0.00%	0.00%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1998	0.00%	0.00%	0.00%	1.69%	3.03%	0.00%	11.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1999	0.00%	0.00%	0.00%	0.00%	0.00%	3.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2000	0.00%	0.00%	0.00%	1.52%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	20.00%	25.00%	0.00%	0.00%	0.00%	0.00%
2001	0.00%	0.00%	0.00%	0.00%	2.86%	8.70%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2002	0.00%	0.00%	1.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%
2003	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2004	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	0.00%	0.00%	0.00%
2005	0.00%	0.00%	0.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2006	0.00%	0.00%	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2007	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%	7.69%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%		
2008	0.00%	0.52%	0.00%	0.98%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	10.00%	0.00%			
2009	0.00%	0.00%	0.00%	0.00%	2.44%	0.00%	8.33%	0.00%	0.00%	11.11%	12.50%	0.00%	0.00%	0.00%	0.00%				
2010	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%					
2011	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%						
2012	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.76%	7.69%	0.00%	0.00%	0.00%							
2013	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%								
2014	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
2015	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%										
2016	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
2017	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
2018	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
2019	0.00%	0.00%	0.00%	0.00%	0.00%														
2020	0.00%	0.00%	0.00%	0.00%															
2021	0.00%	0.00%	0.00%																
2022	0.00%	0.00%																	
2023	0.00%																		
Wtd Avg	0.001964																		
5 Yr	0.00%	0.00%	0.00%	0.00%	2.13%	0.00%	0.00%	4.84%	5.08%	1.92%	2.04%	2.56%	2.70%	0.00%	3.23%	2.70%	0.00%	0.00%	0.00%
10 Yr	0.00%	0.00%	0.00%	0.00%	0.43%	0.00%	0.68%	3.08%	2.63%	2.06%	1.05%	1.22%	2.56%	0.00%	2.86%	1.43%	1.54%	0.00%	0.00%
15 Yr	0.00%	0.07%	0.00%	0.25%	0.47%	0.34%	1.36%	2.12%	1.83%	2.08%	0.75%	0.85%	1.63%	1.67%	1.69%	0.78%	1.49%	0.00%	0.00%
All Yr	0.06%	0.51%	0.92%	1.29%	0.98%	1.29%	1.83%	1.52%	1.52%	1.07%	1.46%	1.15%	1.60%	1.46%	1.25%	1.03%	0.93%	0.98%	0.69%
All Avg Rolling	0.000559	0.000792155	0.001294	0.002531067	0.005391	0.00598	0.007924	0.014205	0.022068	0.02479	0.019581	0.015179	0.016312	0.014502	0.017211	0.015077	0.015776	0.009066	0.004695
Linear Smoothed	0.00%	0.00%	0.02%	0.33%	0.64%	0.94%	1.25%	1.56%	1.87%	2.17%	2.06%	1.89%	1.71%	1.54%	1.36%	1.18%	1.01%	0.83%	0.66%
Prior Sel	0.00%	0.00%	0.05%	0.27%	0.49%	0.71%	0.93%	1.15%	1.37%	1.59%	1.80%	1.71%	1.61%	1.52%	1.43%	1.33%	1.24%	1.14%	0.31%
Selected	0.00%	0.00%	0.05%	0.27%	0.49%	0.85%	1.23%	1.57%	1.81%	1.93%	1.94%	1.86%	1.72%	1.55%	1.37%	1.19%	1.04%	0.89%	0.76%
Active	0.00%	0.00%	0.03%	0.19%	0.34%	0.60%	0.86%	1.10%	1.26%	1.35%	1.36%	1.30%	1.21%	1.08%	0.96%	0.84%	0.73%	0.63%	0.54%
Inactive	0.00%	0.00%	0.08%	0.43%	0.78%	1.36%	1.97%	2.52%	2.89%	3.09%	3.10%	2.98%	2.76%	2.48%	2.19%	1.91%	1.66%	1.43%	1.22%
Phased Release	0.00%	0.00%	0.09%	0.49%	0.90%	1.58%	2.28%	2.91%	3.34%	3.57%	3.59%	3.45%	3.19%	2.87%	2.53%	2.21%	1.92%	1.65%	1.41%
x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Other
Percent Forfeited

Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1979	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1981	1.10%	1.14%	0.00%	0.00%	1.30%	2.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1982	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1983	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%
1984	0.00%	1.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.04%	0.00%	2.08%	0.00%	0.00%	2.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1985	4.17%	0.00%	0.00%	4.35%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1986	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1987	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%		
1988	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1989	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1990	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1991	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1992	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1997	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1998	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1999	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
2000	0.00%	0.00%	0.00%	0.00%	0.00%															
2001	0.00%	0.00%	0.00%	0.00%																
2002	0.00%	0.00%	0.00%																	
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Wtd Avg																				
5 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.49%	0.00%	0.00%	0.74%	0.00%
10 Yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%	0.00%	0.00%	0.50%	0.00%	0.39%	0.00%	0.00%	0.46%	0.00%
15 Yr	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%	1.08%	0.59%	0.29%	0.00%	0.32%	0.68%	0.00%	0.37%	0.00%	0.00%	0.44%	0.00%
All Yr	0.36%	0.38%	0.20%	0.21%	0.43%	0.44%	0.00%	0.24%	0.76%	0.52%	0.27%	0.00%	0.30%	0.65%	0.00%	0.36%	0.00%	0.00%	0.44%	0.00%
All Avg Rolling	0.001693	0.001192	0.00078	0.00065	0.001192	0.001396	0.001225	0.000569	0.001728	0.00332	0.003591	0.002064	0.000995	0.002041	0.002041	0.003693	0.002176	0.002176	0.001728	0.001728
Linear Smoothed	0.48%	0.31%	0.13%	-0.04%	-0.22%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%
Prior Sel	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%
Selected	0.65%	0.55%	0.53%	0.52%	0.51%	0.49%	0.48%	0.47%	0.46%	0.45%	0.44%	0.43%	0.41%	0.40%	0.39%	0.38%	0.37%	0.37%	0.36%	0.35%
Active	0.45%	0.38%	0.37%	0.36%	0.36%	0.35%	0.34%	0.33%	0.32%	0.31%	0.31%	0.30%	0.29%	0.28%	0.28%	0.27%	0.26%	0.26%	0.25%	0.24%
Inactive	1.04%	0.88%	0.85%	0.83%	0.81%	0.79%	0.77%	0.75%	0.73%	0.72%	0.70%	0.68%	0.66%	0.65%	0.63%	0.61%	0.60%	0.58%	0.57%	0.56%
Phased Release	1.20%	1.01%	0.99%	0.96%	0.94%	0.92%	0.89%	0.87%	0.85%	0.83%	0.81%	0.79%	0.77%	0.75%	0.73%	0.71%	0.69%	0.68%	0.66%	0.64%
x	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

Other
Percent Forfeited

Issue Year	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1979	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
1980	0.00%	0.00%	0.00%	0.00%	0.00%															
1981	1.72%	3.70%	0.00%	0.00%																
1982	0.00%	0.00%	0.00%																	
1983	0.00%	0.00%																		
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Wtd Avg																				
5 Yr	0.60%	1.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	0.54%	1.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	0.53%	1.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	0.53%	1.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0.003561	0.006722	0.006722	0.004888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linear Smoothed	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%	-0.40%
Prior Sel	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%		
Selected	0.34%	0.33%	0.32%	0.31%	0.31%	0.30%	0.29%	0.28%	0.28%	0.27%	0.26%	0.26%	0.25%	0.24%	0.24%	0.23%	0.23%	0.22%	0.21%	0.21%
Active	0.24%	0.23%	0.23%	0.22%	0.21%	0.21%	0.20%	0.20%	0.19%	0.19%	0.18%	0.18%	0.17%	0.17%	0.17%	0.16%	0.16%	0.15%	0.15%	0.15%
Inactive	0.54%	0.53%	0.51%	0.50%	0.49%	0.48%	0.47%	0.45%	0.44%	0.43%	0.42%	0.41%	0.40%	0.39%	0.38%	0.37%	0.36%	0.35%	0.34%	0.33%
Phased Release	0.63%	0.61%	0.60%	0.58%	0.57%	0.55%	0.54%	0.52%	0.51%	0.50%	0.49%	0.47%	0.46%	0.45%	0.44%	0.43%	0.42%	0.41%	0.40%	0.39%
x	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59

Other
Percent Released

Issue Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	16.67%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.38%	27.27%	12.50%	0.00%	14.29%	16.67%	0.00%	0.00%	20.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.39%	26.32%	7.69%	41.67%	16.67%	20.00%	0.00%	0.00%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.76%	26.32%	21.43%	18.18%	0.00%	22.22%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	6.25%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%
1978	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.88%	25.00%	8.33%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%
1979	0.00%	0.00%	0.00%	0.00%	0.00%	5.26%	5.88%	6.67%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	27.27%	12.50%
1980	0.00%	0.00%	0.00%	0.00%	2.94%	6.06%	6.45%	11.11%	0.00%	0.00%	0.00%	0.00%	4.35%	0.00%	0.00%	4.55%	9.52%	0.00%	0.00%
1981	0.00%	0.00%	0.00%	1.63%	0.83%	0.85%	1.72%	0.88%	0.00%	0.00%	2.65%	0.00%	3.64%	0.00%	0.95%	0.98%	3.03%	4.17%	1.09%
1982	0.00%	0.00%	1.45%	0.00%	1.61%	3.28%	1.75%	1.79%	3.77%	0.00%	8.00%	0.00%	2.22%	4.88%	7.69%	8.82%	3.23%	3.45%	10.71%
1983	0.00%	1.82%	1.86%	3.85%	6.06%	6.63%	2.40%	0.62%	1.26%	5.77%	3.47%	9.56%	2.52%	0.88%	8.18%	2.97%	1.03%	4.17%	4.49%
1984	0.00%	1.50%	1.53%	4.03%	4.27%	6.25%	1.92%	0.99%	4.04%	4.21%	7.78%	2.53%	2.60%	2.70%	4.35%	1.54%	6.25%	1.72%	7.02%
1985	0.00%	0.00%	3.90%	2.82%	2.99%	3.08%	0.00%	8.06%	8.77%	6.12%	13.04%	2.63%	10.81%	0.00%	3.13%	6.45%	0.00%	7.69%	0.00%
1986	0.00%	2.50%	2.74%	2.99%	0.00%	3.23%	11.67%	9.80%	11.36%	8.11%	6.06%	6.45%	17.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1987	0.00%	2.25%	6.02%	5.13%	4.23%	16.42%	12.96%	13.64%	15.79%	12.90%	15.38%	9.52%	5.26%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%
1988	1.63%	4.07%	3.45%	2.73%	11.21%	20.21%	12.33%	28.81%	16.67%	0.00%	14.71%	17.86%	4.35%	4.76%	10.53%	5.88%	0.00%	6.67%	0.00%
1989	0.00%	0.73%	0.00%	18.90%	23.30%	20.25%	21.31%	26.67%	6.45%	6.90%	11.11%	4.17%	5.00%	10.53%	5.88%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	1.35%	27.97%	32.35%	34.85%	47.50%	35.00%	7.69%	8.33%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	10.00%	0.00%	11.11%	0.00%
1991	0.00%	20.10%	34.59%	34.62%	37.31%	36.59%	4.17%	17.39%	5.26%	0.00%	0.00%	5.88%	0.00%	0.00%	6.25%	6.67%	0.00%	0.00%	0.00%
1992	1.18%	22.94%	25.19%	37.76%	31.58%	10.53%	24.24%	0.00%	12.00%	0.00%	4.55%	4.76%	0.00%	0.00%	5.00%	0.00%	10.53%	0.00%	0.00%
1993	1.18%	13.61%	33.56%	45.05%	20.41%	12.82%	14.71%	3.45%	0.00%	11.11%	4.17%	0.00%	8.70%	4.76%	5.00%	0.00%	0.00%	10.53%	5.88%
1994	2.63%	27.19%	42.17%	29.17%	18.18%	14.81%	4.35%	0.00%	4.55%	0.00%	0.00%	0.00%	5.00%	5.26%	0.00%	0.00%	5.56%	0.00%	0.00%
1995	4.00%	21.33%	44.07%	41.54%	42.11%	31.82%	0.00%	13.33%	0.00%	0.00%	0.00%	7.69%	8.33%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%
1996	3.08%	33.85%	38.37%	47.17%	37.04%	47.06%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%
1997	3.70%	20.37%	36.43%	37.80%	32.00%	8.82%	3.23%	16.67%	20.00%	0.00%	5.00%	0.00%	0.00%	5.26%	0.00%	5.56%	6.25%	0.00%	0.00%
1998	7.41%	30.86%	47.32%	42.37%	39.39%	10.53%	17.65%	8.33%	27.27%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%
1999	10.71%	21.43%	38.18%	33.82%	26.67%	39.39%	26.32%	42.86%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%
2000	3.42%	19.66%	29.79%	40.91%	39.47%	34.78%	26.67%	18.18%	11.11%	28.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2001	4.80%	27.20%	27.47%	46.97%	31.43%	17.39%	23.53%	30.77%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%
2002	5.45%	12.73%	39.58%	35.09%	35.14%	16.67%	30.00%	14.29%	8.33%	0.00%	9.09%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2003	3.75%	18.75%	27.69%	48.94%	25.00%	44.44%	0.00%	0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%
2004	7.09%	22.05%	23.23%	52.63%	44.44%	30.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%
2005	4.69%	10.16%	39.13%	56.52%	36.67%	31.58%	23.08%	20.00%	37.50%	0.00%	0.00%	20.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2006	3.03%	16.16%	48.19%	63.95%	26.67%	13.64%	36.84%	16.67%	0.00%	10.00%	0.00%	11.11%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	
2007	4.37%	24.04%	42.45%	48.75%	31.71%	35.71%	22.22%	23.08%	0.00%	0.00%	0.00%	22.22%	0.00%	0.00%	0.00%	0.00%	0.00%		
2008	2.09%	15.18%	36.65%	50.98%	44.90%	33.33%	17.65%	7.14%	7.69%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%			
2009	2.84%	20.45%	43.57%	48.10%	48.78%	40.00%	0.00%	9.09%	10.00%	0.00%	0.00%	0.00%	14.29%	16.67%	0.00%				
2010	2.80%	13.29%	49.19%	49.21%	28.13%	13.04%	20.00%	18.75%	0.00%	7.69%	18.18%	0.00%	0.00%	0.00%					
2011	0.58%	8.19%	38.85%	53.13%	28.89%	43.75%	22.22%	42.86%	12.50%	20.00%	0.00%	0.00%	0.00%						
2012	0.00%	12.96%	46.81%	38.67%	32.61%	16.13%	34.62%	11.76%	30.77%	0.00%	0.00%	0.00%							
2013	2.27%	18.94%	32.71%	44.44%	20.00%	31.25%	4.55%	0.00%	10.00%	0.00%	0.00%								
2014	3.57%	20.24%	49.25%	32.35%	39.13%	28.57%	20.00%	0.00%	0.00%	0.00%									
2015	4.48%	22.39%	36.54%	48.48%	29.41%	9.09%	0.00%	0.00%	0.00%										
2016	6.67%	20.00%	41.67%	35.71%	11.11%	25.00%	0.00%	0.00%											
2017	6.98%	13.95%	54.05%	47.06%	22.22%	14.29%	0.00%												
2018	1.75%	26.32%	54.76%	73.68%	20.00%	25.00%													
2019	6.45%	24.19%	61.70%	61.11%	28.57%														
2020	0.00%	31.03%	77.50%	33.33%															
2021	5.71%	11.43%	48.39%																
2022	0.00%	7.89%																	
2023	0.00%																		
Wtd Avg																			
5 Yr	2.42%	22.00%	59.90%	53.25%	23.40%	20.45%	5.56%	3.23%	11.86%	3.85%	4.08%	0.00%	2.70%	2.63%	0.00%	8.11%	3.13%	0.00%	0.00%
10 Yr	3.40%	20.46%	47.79%	46.51%	27.90%	26.92%	15.65%	12.31%	7.89%	4.12%	2.11%	4.88%	3.85%	1.32%	0.00%	4.29%	1.54%	1.39%	2.94%
15 Yr	2.36%	16.77%	44.46%	49.56%	32.78%	27.85%	16.74%	12.70%	8.54%	4.17%	2.99%	4.24%	2.44%	1.67%	0.00%	3.10%	3.73%	2.17%	2.16%
All Yr	2.52%	14.81%	29.13%	29.55%	19.16%	15.38%	9.24%	8.61%	5.89%	4.67%	6.14%	4.83%	4.69%	2.25%	3.48%	2.80%	2.95%	3.59%	2.94%
All Avg Rolling	0.025177	0.10592948	0.221687	0.361829372	0.386163	0.3106	0.200865	0.145532	0.098514	0.073195	0.05525	0.038383	0.035778	0.029573	0.020856	0.0247	0.0276	0.030658	0.022115
Linear Smoothed	2.46%	12.24%	22.02%	31.79%	41.57%	28.68%	23.75%	18.82%	13.89%	8.96%	4.03%	3.51%	3.35%	3.19%	3.03%	2.88%	2.72%	2.56%	2.41%
Prior Sel	4.05%	9.85%	15.64%	21.44%	27.24%	19.65%	16.76%	13.87%	10.98%	8.09%	5.20%	3.88%	3.70%	3.52%	3.35%	3.17%	2.99%	2.81%	2.63%
Selected	0.00%	18.05%	29.68%	33.38%	31.38%	25.90%	19.17%	13.47%	10.32%	8.87%	7.74%	6.70%	5.76%	4.92%	4.17%	3.50%	2.91%	2.41%	1.97%
Active	0.00%	15.35%	25.23%	28.37%	26.67%	22.01%	16.29%	11.45%	8.77%	7.54%	6.58%	5.70%	4.90%	4.18%	3.54%	2.98%	2.48%	2.05%	1.68%
Inactive	0.00%	9.03%	14.84%	16.69%	15.69%	12.95%	9.58%	6.74%	5.16%	4.44%	3.87%	3.35%	2.88%	2.46%	2.08%	1.75%	1.46%	1.20%	0.99%
Phased Release	0.00%	41.52%	68.27%	76.77%	72.17%	59.57%	44.09%	30.99%	23.72%	20.41%	17.79%	15.41%	13.26%	11.32%	9.58%	8.05%	6.70%	5.54%	4.54%

Other
Percent Released

Issue Year	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
1969	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	33.33%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1973	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1974	0.00%	0.00%	0.00%	0.00%	25.00%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1975	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%
1976	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1977	10.00%	0.00%	22.22%	14.29%	0.00%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1978	11.11%	25.00%	0.00%	0.00%	33.33%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%
1979	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1980	0.00%	0.00%	0.00%	5.26%	5.56%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	6.25%	0.00%	0.00%	20.00%	8.33%	0.00%	0.00%	0.00%	0.00%
1981	2.20%	4.55%	2.41%	4.94%	1.30%	1.33%	4.17%	0.00%	1.45%	0.00%	2.94%	1.52%	0.00%	1.54%	1.59%	1.61%	1.64%	1.67%	0.00%	1.69%
1982	8.70%	4.76%	0.00%	0.00%	5.00%	0.00%	5.26%	5.56%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	6.67%	21.43%	0.00%	0.00%	9.09%	10.00%
1983	3.61%	5.00%	2.63%	1.35%	5.48%	2.90%	5.97%	3.17%	0.00%	1.69%	1.72%	1.75%	0.00%	1.79%	0.00%	3.64%	3.77%	1.96%	2.00%	4.17%
1984	1.89%	0.00%	1.96%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.13%	2.17%	0.00%	0.00%	0.00%	0.00%	2.27%	0.00%
1985	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.55%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	5.26%	0.00%	0.00%	0.00%	0.00%
1986	4.76%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	0.00%	5.88%	12.50%	0.00%	7.14%	0.00%	0.00%	0.00%	
1987	0.00%	6.25%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.33%	9.09%	0.00%	11.11%	12.50%		
1988	0.00%	7.14%	0.00%	0.00%	7.69%	0.00%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1989	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1990	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1991	9.09%	0.00%	10.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	14.29%	0.00%						
1992	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.25%	6.67%	0.00%	0.00%	7.14%							
1993	0.00%	6.25%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%								
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.25%									
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%										
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%											
1997	0.00%	6.67%	0.00%	0.00%	0.00%	0.00%	7.14%	0.00%												
1998	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1999	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%														
2000	0.00%	0.00%	0.00%	0.00%	33.33%															
2001	0.00%	0.00%	0.00%	0.00%																
2002	0.00%	0.00%	0.00%																	
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2004	0.00%																			
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Wtd Avg																				
5 Yr	0.00%	0.00%	0.00%	0.00%	3.03%	0.00%	2.00%	0.00%	3.33%	1.61%	5.00%	0.00%	3.77%	2.00%	1.75%	2.99%	1.06%	1.49%	2.21%	2.25%
10 Yr	0.00%	1.25%	0.00%	0.00%	2.02%	0.97%	0.91%	0.00%	1.77%	1.60%	2.26%	0.62%	1.96%	2.48%	1.19%	3.54%	1.70%	1.79%	1.38%	1.96%
15 Yr	1.42%	1.39%	0.67%	0.65%	1.81%	0.55%	1.34%	1.08%	0.72%	0.89%	1.76%	1.55%	1.30%	2.04%	2.11%	3.30%	1.60%	2.09%	1.32%	1.90%
All Yr	2.35%	3.02%	1.98%	2.05%	2.98%	1.55%	3.43%	1.44%	1.01%	1.30%	1.63%	1.44%	1.52%	2.26%	2.05%	3.58%	1.57%	2.08%	1.32%	1.90%
All Avg Rolling	0.015798	0.014553	0.010058	0.00917	0.012652	0.013003	0.017155	0.011059	0.014194	0.012292	0.019063	0.016376	0.019004	0.017444	0.020356	0.024403	0.022042	0.022336	0.016345	0.018061
Linear Smoothed	2.25%	2.09%	1.93%	1.78%	1.62%	1.46%	1.30%	1.15%	0.99%	0.83%	2.04%	2.05%	2.05%	2.06%	2.07%	2.08%	2.09%	2.09%	2.10%	2.11%
Prior Sel	2.45%	2.27%	2.09%	1.91%	1.73%	1.55%	1.37%	1.19%	1.01%	0.83%	1.50%	1.61%	1.72%	1.83%	1.93%	2.04%	2.15%	2.26%	2.36%	2.47%
Selected	1.61%	1.31%	1.07%	0.89%	0.76%	0.68%	0.65%	0.65%	0.69%	0.77%	0.87%	1.00%	1.15%	1.31%	1.49%	1.67%	1.86%	2.04%	2.22%	2.40%
Active	1.37%	1.11%	0.91%	0.76%	0.65%	0.58%	0.55%	0.55%	0.59%	0.65%	0.74%	0.85%	0.98%	1.11%	1.26%	1.42%	1.58%	1.74%	1.89%	2.04%
Inactive	0.80%	0.65%	0.54%	0.44%	0.38%	0.34%	0.32%	0.33%	0.35%	0.38%	0.44%	0.50%	0.57%	0.66%	0.74%	0.83%	0.93%	1.02%	1.11%	1.20%
Phased Release	3.70%	3.01%	2.46%	2.04%	1.75%	1.57%	1.49%	1.50%	1.60%	1.77%	2.01%	2.30%	2.64%	3.02%	3.42%	3.84%	4.27%	4.70%	5.12%	5.51%

Other
Percent Released

Issue Year	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708
1965	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1966	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1967	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
1968	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
1969	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
1970	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%					
1971	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
1972	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							
1973	0.00%	0.00%	33.33%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%								
1974	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%									
1975	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%										
1976	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%											
1977	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%												
1978	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%													
1979	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%														
1980	0.00%	9.09%	10.00%	0.00%	0.00%															
1981	5.17%	0.00%	1.92%	5.88%																
1982	0.00%	0.00%	0.00%																	
1983	0.00%	0.00%																		
1984	2.33%																			
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2023																				
Wtd Avg																				
5 Yr	2.40%	0.80%	2.60%	5.71%	0.00%	0.00%	0.00%	9.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10 Yr	2.17%	1.45%	3.30%	5.00%	3.57%	0.00%	7.14%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15 Yr	2.12%	1.41%	3.26%	5.00%	3.57%	0.00%	7.14%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Yr	2.12%	1.41%	3.26%	5.00%	3.57%	0.00%	7.14%	8.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Avg Rolling	0.019184	0.018223	0.021903	0.03183	0.036537	0.02619	0.026786	0.046266	0.046266	0.028409	0	0	0	0	0	0	0	0	0	0
Linear Smoothed	2.12%	2.13%	2.13%	2.14%	2.15%	2.16%	2.17%	2.17%	2.18%	2.19%	2.20%	2.21%	2.22%	2.22%	2.23%	2.24%	2.25%	2.26%	2.26%	2.27%
Prior Sel	2.58%	2.69%	2.79%	2.90%	3.01%	3.12%	3.22%	3.33%	3.44%	3.55%	3.65%	3.76%	3.87%	3.98%	4.08%	4.19%	4.30%	4.41%		
Selected	2.56%	2.70%	2.82%	2.92%	2.99%	3.02%	3.02%	2.96%	2.90%	2.84%	2.79%	2.73%	2.68%	2.62%	2.57%	2.52%	2.47%	2.42%	2.37%	2.32%
Active	2.17%	2.30%	2.40%	2.48%	2.54%	2.57%	2.57%	2.52%	2.47%	2.42%	2.37%	2.32%	2.27%	2.23%	2.18%	2.14%	2.10%	2.06%	2.01%	1.97%
Inactive	1.28%	1.35%	1.41%	1.46%	1.49%	1.51%	1.51%	1.48%	1.45%	1.42%	1.39%	1.37%	1.34%	1.31%	1.29%	1.26%	1.23%	1.21%	1.19%	1.16%
Phased Release	5.88%	6.21%	6.49%	6.72%	6.87%	6.95%	6.95%	6.81%	6.67%	6.54%	6.41%	6.28%	6.15%	6.03%	5.91%	5.79%	5.68%	5.56%	5.45%	5.34%

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Remaining Acres Projections
All Mine Types

Fiscal Year Ending 6/30	(1) Deterministic Model	(2) Stochastic Mean	(3) Stochastic Median	(4) Selected	(5) % Remaining In Force Total	(6) Surface	(7) Underground
2023	333,366	333,366	333,366	333,366	100%	100%	100%
2024	324,642	307,402	307,603	307,402	92%	92%	92%
2025	316,143	283,339	283,503	299,823	90%	90%	90%
2026	307,942	259,605	259,764	283,853	85%	86%	86%
2027	300,105	235,018	235,124	267,615	80%	81%	81%
2028	292,633	213,492	213,617	253,125	76%	76%	77%
2029	285,491	194,497	194,641	240,066	72%	72%	73%
2030	278,646	177,572	177,706	228,176	68%	69%	70%
2031	272,071	162,210	162,220	217,145	65%	65%	66%
2032	265,745	148,350	148,370	207,057	62%	62%	64%
2033	259,657	135,734	135,765	197,711	59%	60%	61%
2034	253,800	124,260	124,294	189,047	57%	57%	59%
2035	248,167	113,790	113,957	181,062	54%	54%	57%
2036	242,751	104,097	104,127	173,439	52%	52%	54%
2037	237,546	95,264	95,361	166,454	50%	50%	53%
2038	232,549	87,124	87,194	159,871	48%	48%	51%
2039	227,754	79,629	79,680	153,717	46%	46%	49%
2040	223,156	72,752	72,874	148,015	44%	44%	48%
2041	218,749	66,464	66,492	142,620	43%	43%	46%
2042	214,526	60,685	60,719	137,623	41%	41%	45%
2043	210,478	55,408	55,385	132,932	40%	40%	44%

Notes: Col (1) from Exhibit E-86, Col (20), (35), (50), etc.
Col (2) from Exhibit E-139, Col (16)
Col (3) from Exhibit E-139, Col (14)
Col (5) = Col (4) / [Col (4) 2019 Total]
Col (6) and (7) based on Col (5), Distributed according to Exhibit E-86

West Virginia Department of Environmental Protection Office of Special Reclamatic
Actuarial Reserve Study as of June 30, 2023
Bond Forfeiture Projections
All Mine Types

	(1)	(2)	(3)	(4)
		Bond Forfeiture Recoveries		
Fiscal Year Ending 6/30	Deterministic Model	Stochastic Mean	Stochastic Median	Selected
2024	3,161,484	9,431,727	7,974,748	3,161,484
2025	3,059,556	6,081,602	4,441,311	3,059,556
2026	2,949,822	6,094,404	4,542,464	2,949,822
2027	2,829,516	5,996,570	4,464,028	2,829,516
2028	2,705,550	5,425,296	3,928,117	2,705,550
2029	2,582,331	4,933,493	3,417,320	2,582,331
2030	2,461,985	4,711,135	3,180,332	2,461,985
2031	2,343,591	4,462,820	2,768,560	2,343,591
2032	2,230,714	4,069,104	2,320,244	2,230,714
2033	2,121,507	3,693,853	1,962,080	2,121,507
2034	2,016,801	3,220,927	1,612,940	2,016,801
2035	1,917,336	3,011,713	1,464,040	1,917,336
2036	1,821,293	2,628,647	1,123,540	1,821,293
2037	1,729,694	2,329,061	862,280	1,729,694
2038	1,641,935	2,176,618	753,120	1,641,935
2039	1,557,794	1,907,370	522,940	1,557,794
2040	1,477,642	1,708,684	392,440	1,477,642
2041	1,403,353	1,488,303	275,000	1,403,353
2042	1,333,199	1,328,000	174,840	1,333,199
2043	1,268,938	1,143,833	110,000	1,268,938
Total	42,614,042	75,843,158	46,290,344	42,614,042

Notes: Col (1) from Exhibit E-77, Col (17), (32), etc.
Col (2) from Exhibit E-139, Col (8)
Col (3) from Exhibit E-139, Col (6)

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Cost Projections
All Mine Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Land Reclamation Costs					Water Capital Costs					Water O&M Costs				
Fiscal Year	Deterministic	Stochastic	Stochastic		Three-Year	Deterministic	Stochastic	Stochastic		Three-Year	Deterministic	Stochastic	Stochastic		Three-Year
Ending 6/30	Model	Mean	Median	Selected	Delay	Model	Mean	Median	Selected	Delay	Model	Mean	Median	Selected	Delay
2024	6,372,664	10,175,263	8,937,011	8,273,963	0	6,360,415	9,530,462	8,370,678	7,945,438	0	122,986	251,629	221,008	198,541	0
2025	6,083,274	7,885,651	6,761,732	6,984,462	0	6,052,738	7,385,942	6,333,245	6,719,340	0	240,498	446,638	388,222	358,453	0
2026	5,787,491	7,183,966	5,970,629	6,485,729	0	5,740,820	6,728,723	5,592,274	6,234,772	0	352,380	624,294	535,873	504,182	0
2027	5,477,740	6,160,480	4,983,760	5,819,110	4,136,982	5,414,903	5,770,094	4,667,942	5,592,498	3,972,719	458,346	776,639	659,119	631,368	99,271
2028	5,160,524	5,445,979	4,243,576	5,303,251	7,629,213	5,081,517	5,100,871	3,974,663	5,091,194	7,332,389	558,228	911,316	764,061	744,535	278,497
2029	4,851,241	4,867,597	3,760,946	4,859,419	6,735,095	4,759,086	4,559,141	3,522,617	4,659,113	6,477,056	652,141	1,031,689	857,067	846,966	431,318
2030	4,555,570	4,501,328	3,283,978	4,528,449	6,152,419	4,452,856	4,216,082	3,075,874	4,334,469	5,913,635	740,303	1,143,005	938,278	940,529	567,775
2031	4,274,430	4,155,677	2,955,933	4,215,053	8,212,806	4,163,678	3,892,334	2,768,617	4,028,006	7,887,443	822,966	1,245,773	1,011,377	1,026,705	1,060,219
2032	4,011,683	3,717,954	2,526,859	3,864,818	4,859,419	3,896,798	3,482,350	2,366,733	3,689,574	4,659,113	900,452	1,337,716	1,073,865	1,104,011	846,966
2033	3,764,817	3,430,967	2,219,857	3,597,892	4,528,449	3,647,764	3,213,548	2,079,186	3,430,656	4,334,469	973,062	1,422,562	1,128,761	1,174,795	940,529
2034	3,533,731	2,946,022	1,858,427	3,239,877	4,215,053	3,415,411	2,759,335	1,740,659	3,087,373	4,028,006	1,038,634	1,495,416	1,174,719	1,236,256	1,026,705
2035	3,323,394	2,693,248	1,665,944	3,008,321	3,864,818	3,207,227	2,522,578	1,560,374	2,864,903	3,689,574	1,097,693	1,562,019	1,215,917	1,291,876	1,104,011
2036	3,126,391	2,363,979	1,387,993	2,745,185	3,597,892	3,013,092	2,214,175	1,300,037	2,613,634	3,430,656	1,150,661	1,620,479	1,250,242	1,340,460	1,174,795
2037	2,944,545	2,068,748	1,157,354	2,506,646	3,239,877	2,835,639	1,937,653	1,084,013	2,386,646	3,087,373	1,197,981	1,671,638	1,278,862	1,382,827	1,236,256
2038	2,777,670	1,968,790	978,118	2,373,230	3,008,321	2,674,485	1,844,029	916,136	2,259,257	2,864,903	1,240,091	1,720,325	1,303,051	1,421,156	1,291,876
2039	2,621,619	1,695,143	777,354	2,158,381	2,745,185	2,524,055	1,587,723	728,094	2,055,889	2,613,634	1,277,365	1,762,245	1,322,274	1,453,962	1,340,460
2040	2,475,248	1,496,819	641,824	1,986,034	2,506,646	2,382,872	1,401,967	601,152	1,892,419	2,386,646	1,310,153	1,799,261	1,338,146	1,482,520	1,382,827
2041	2,340,109	1,298,277	430,255	1,819,193	2,373,230	2,252,762	1,216,006	402,990	1,734,384	2,259,257	1,338,817	1,831,367	1,348,786	1,506,323	1,421,156
2042	2,213,758	1,155,976	324,228	1,684,867	2,158,381	2,131,136	1,082,723	303,682	1,606,929	2,055,889	1,363,669	1,859,953	1,356,804	1,526,809	1,453,962
2043	2,098,103	999,567	208,431	1,548,835	1,986,034	2,019,137	936,225	195,223	1,477,681	1,892,419	1,385,027	1,884,672	1,361,959	1,543,886	1,482,520
Total	77,794,001	76,211,430	55,074,209	77,002,716	71,949,820	76,026,393	71,381,958	51,584,190	73,704,175	68,885,181	18,221,453	26,398,636	20,528,394	21,716,161	17,139,143

Notes: Col (1) from Exhibit E-73, Col (4)
Col (2) from Exhibit E-142, Col (16)
Col (3) from Exhibit E-142, Col (14)
Col (6) from Exhibit E-95, Col (4)
Col (7) from Exhibit E-143, Col (16)
Col (8) from Exhibit E-143, Col (14)
Col (11) from Exhibit E-117, Col (12)
Col (12) from Exhibit E-144, Col (16)
Col (13) from Exhibit E-144, Col (14)
Cols (5), (10), and (15) based on (4), (9), and (14), respectively, with a three-year delay on payments

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model
Land Total - All Mine Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay				Net Liability				Net Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	4,769,135	1,260,279	343,251	6,372,664	0	0	0	0	2,336,094	637,281	237,806	3,211,180	0	0	0	0
2025	4,575,759	1,202,408	305,107	6,083,274	0	0	0	0	2,213,556	604,189	205,972	3,023,717	0	0	0	0
2026	4,370,478	1,145,510	271,502	5,787,491	0	0	0	0	2,086,969	572,411	178,289	2,837,669	0	0	0	0
2027	4,145,711	1,089,841	242,188	5,477,740	2,384,568	630,139	171,625	3,186,332	1,951,784	541,942	154,497	2,648,223	1,168,047	318,640	118,903	1,605,590
2028	3,908,969	1,034,967	216,588	5,160,524	4,672,447	1,231,343	324,179	6,227,969	1,808,292	512,538	134,143	2,454,974	2,274,825	620,735	221,889	3,117,449
2029	3,674,967	982,020	194,253	4,851,241	4,473,118	1,173,959	288,305	5,935,382	1,667,851	484,061	116,997	2,268,910	2,150,263	588,300	192,130	2,930,693
2030	3,448,298	932,351	174,920	4,555,570	4,258,095	1,117,676	256,845	5,632,615	1,533,308	457,608	102,670	2,093,585	2,019,377	557,176	166,393	2,742,946
2031	3,231,136	885,319	157,976	4,274,430	5,981,824	1,579,887	337,682	7,899,393	1,407,581	432,700	90,558	1,930,839	2,784,185	783,509	211,392	3,779,086
2032	3,028,369	840,249	143,064	4,011,683	3,674,967	982,020	194,253	4,851,241	1,291,839	408,853	80,277	1,780,969	1,667,851	484,061	116,997	2,268,910
2033	2,837,800	797,134	129,883	3,764,817	3,448,298	932,351	174,920	4,555,570	1,185,733	386,075	71,502	1,643,310	1,533,308	457,608	102,670	2,093,585
2034	2,659,548	755,953	118,231	3,533,731	3,231,136	885,319	157,976	4,274,430	1,088,552	364,500	63,878	1,516,930	1,407,581	432,700	90,558	1,930,839
2035	2,498,832	716,725	107,838	3,323,394	3,028,369	840,249	143,064	4,011,683	1,004,803	344,095	57,160	1,406,058	1,291,839	408,853	80,277	1,780,969
2036	2,347,939	679,790	98,662	3,126,391	2,837,800	797,134	129,883	3,764,817	928,827	324,931	51,340	1,305,098	1,185,733	386,075	71,502	1,643,310
2037	2,208,950	645,006	90,588	2,944,545	2,659,548	755,953	118,231	3,533,731	861,560	306,953	46,338	1,214,851	1,088,552	364,500	63,878	1,516,930
2038	2,082,188	612,124	83,358	2,777,670	2,498,832	716,725	107,838	3,323,394	803,835	289,990	41,911	1,135,735	1,004,803	344,095	57,160	1,406,058
2039	1,963,710	580,955	76,953	2,621,619	2,347,939	679,790	98,662	3,126,391	751,842	273,940	38,043	1,063,825	928,827	324,931	51,340	1,305,098
2040	1,852,327	551,663	71,259	2,475,248	2,208,950	645,006	90,588	2,944,545	703,936	259,031	34,639	997,606	861,560	306,953	46,338	1,214,851
2041	1,749,010	524,764	66,335	2,340,109	2,082,188	612,124	83,358	2,777,670	659,590	245,489	31,676	936,756	803,835	289,990	41,911	1,135,735
2042	1,652,139	499,643	61,977	2,213,758	1,963,710	580,955	76,953	2,621,619	618,474	232,921	29,164	880,559	751,842	273,940	38,043	1,063,825
2043	1,563,381	476,642	58,080	2,098,103	1,852,327	551,663	71,259	2,475,248	580,942	221,272	26,951	829,165	703,936	259,031	34,639	997,606

Notes: Col (1) - (3) from Exhibit E-77, Col (15), (30), etc.
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Col (5) - (8) and (13) - (16) based on (1) - (4) and (9) - (12), with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model
Surface Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay				Net Liability				Net Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	2,276,835	526,151	178,877	2,981,862	0	0	0	0	543,912	157,441	94,401	795,755	0	0	0	0
2025	2,231,237	502,746	159,873	2,893,856	0	0	0	0	542,067	149,853	80,947	772,868	0	0	0	0
2026	2,171,195	478,384	142,978	2,792,557	0	0	0	0	532,805	142,030	69,201	744,037	0	0	0	0
2027	2,094,503	453,693	127,998	2,676,193	1,138,417	263,075	89,438	1,490,931	516,064	134,175	58,981	709,220	271,956	78,721	47,201	397,877
2028	2,005,510	428,467	114,637	2,548,614	2,254,036	514,448	169,375	2,937,859	491,292	126,442	50,130	667,864	542,990	153,647	87,674	784,311
2029	1,909,571	404,279	102,798	2,416,647	2,201,216	490,565	151,426	2,843,206	461,287	118,962	42,773	623,023	537,436	145,942	75,074	758,452
2030	1,810,147	381,157	92,306	2,283,611	2,132,849	466,038	135,488	2,734,375	428,211	111,777	36,661	576,649	524,435	138,103	64,091	726,629
2031	1,710,016	358,963	82,994	2,151,972	3,052,762	655,313	178,635	3,886,710	394,679	104,765	31,589	531,033	749,324	193,530	79,621	1,022,474
2032	1,611,058	337,834	74,735	2,023,627	1,909,571	404,279	102,798	2,416,647	360,939	98,097	27,405	486,441	461,287	118,962	42,773	623,023
2033	1,515,196	317,665	67,383	1,900,245	1,810,147	381,157	92,306	2,283,611	328,480	91,748	23,929	444,157	428,211	111,777	36,661	576,649
2034	1,423,229	298,226	60,880	1,782,334	1,710,016	358,963	82,994	2,151,972	297,682	85,762	20,951	404,395	394,679	104,765	31,589	531,033
2035	1,335,551	279,664	55,078	1,670,293	1,611,058	337,834	74,735	2,023,627	269,941	80,119	18,341	368,400	360,939	98,097	27,405	486,441
2036	1,251,498	262,265	49,991	1,563,753	1,515,196	317,665	67,383	1,900,245	244,771	74,834	16,147	335,752	328,480	91,748	23,929	444,157
2037	1,171,237	245,892	45,467	1,462,595	1,423,229	298,226	60,880	1,782,334	222,425	69,868	14,270	306,563	297,682	85,762	20,951	404,395
2038	1,095,160	230,410	41,445	1,367,014	1,335,551	279,664	55,078	1,670,293	202,629	65,129	12,641	280,399	269,941	80,119	18,341	368,400
2039	1,023,297	215,689	37,889	1,276,875	1,251,498	262,265	49,991	1,563,753	185,255	60,553	11,242	257,049	244,771	74,834	16,147	335,752
2040	955,597	201,789	34,730	1,192,116	1,171,237	245,892	45,467	1,462,595	169,562	56,300	10,028	235,890	222,425	69,868	14,270	306,563
2041	892,189	188,794	32,027	1,113,010	1,095,160	230,410	41,445	1,367,014	154,917	52,351	8,981	216,249	202,629	65,129	12,641	280,399
2042	832,470	176,609	29,598	1,038,677	1,023,297	215,689	37,889	1,276,875	141,304	48,652	8,124	198,080	185,255	60,553	11,242	257,049
2043	776,381	165,177	27,434	968,991	955,597	201,789	34,730	1,192,116	128,250	45,172	7,401	180,823	169,562	56,300	10,028	235,890

Notes: Col (1) - (3) from Exhibit E-77, Col (15), (30), etc.
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West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model
Underground Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay				Net Liability				Net Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	717,850	349,543	99,035	1,166,427	0	0	0	0	489,956	241,195	84,616	815,767	0	0	0	0
2025	689,021	332,410	88,934	1,110,366	0	0	0	0	467,728	228,106	75,074	770,908	0	0	0	0
2026	660,091	315,649	80,001	1,055,740	0	0	0	0	445,574	215,282	66,681	727,536	0	0	0	0
2027	631,065	299,248	72,210	1,002,522	358,925	174,771	49,517	583,214	423,482	202,831	59,400	685,714	244,978	120,598	42,308	407,884
2028	602,295	283,790	65,410	951,495	703,436	340,977	93,984	1,138,396	401,714	191,070	53,080	645,863	478,842	234,651	79,845	793,338
2029	574,384	268,823	59,421	902,628	674,556	324,029	84,467	1,083,053	380,724	179,717	47,546	607,987	456,651	221,694	70,877	749,222
2030	547,196	255,616	54,263	857,075	645,578	307,448	76,105	1,029,131	360,428	169,777	42,793	572,998	434,528	209,057	63,040	706,625
2031	521,027	243,397	49,714	814,138	917,828	433,414	101,515	1,452,756	341,056	160,657	38,628	540,340	613,455	292,485	82,780	988,720
2032	495,824	231,599	45,681	773,104	574,384	268,823	59,421	902,628	322,532	151,915	34,957	509,405	380,724	179,717	47,546	607,987
2033	471,731	220,295	42,112	734,138	547,196	255,616	54,263	857,075	304,952	143,565	31,738	480,255	360,428	169,777	42,793	572,998
2034	449,370	209,704	38,940	698,014	521,027	243,397	49,714	814,138	288,619	135,694	28,901	453,214	341,056	160,657	38,628	540,340
2035	428,226	199,704	36,097	664,027	495,824	231,599	45,681	773,104	273,044	128,297	26,383	427,724	322,532	151,915	34,957	509,405
2036	408,171	190,358	33,556	632,085	471,731	220,295	42,112	734,138	258,364	121,430	24,156	403,950	304,952	143,565	31,738	480,255
2037	389,217	181,682	31,267	602,166	449,370	209,704	38,940	698,014	244,580	115,092	22,171	381,843	288,619	135,694	28,901	453,214
2038	371,525	173,574	29,202	574,301	428,226	199,704	36,097	664,027	231,504	109,211	20,402	361,117	273,044	128,297	26,383	427,724
2039	354,952	165,986	27,385	548,322	408,171	190,358	33,556	632,085	219,279	103,756	18,855	341,890	258,364	121,430	24,156	403,950
2040	339,404	158,941	25,790	524,135	389,217	181,682	31,267	602,166	207,905	98,735	17,502	324,143	244,580	115,092	22,171	381,843
2041	324,992	152,605	24,360	501,957	371,525	173,574	29,202	574,301	197,408	94,232	16,294	307,935	231,504	109,211	20,402	361,117
2042	311,420	146,821	23,128	481,370	354,952	165,986	27,385	548,322	187,592	90,148	15,264	293,005	219,279	103,756	18,855	341,890
2043	300,414	141,501	22,024	463,939	339,404	158,941	25,790	524,135	179,484	86,418	14,351	280,253	207,905	98,735	17,502	324,143

Notes: Col (1) - (3) from Exhibit E-77, Col (15), (30), etc.
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Col (5) - (8) and (13) - (16) based on (1) - (4) and (9) - (12), with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model
Other

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay				Net Liability				Net Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	1,774,451	384,585	65,339	2,224,375	0	0	0	0	1,302,225	238,644	58,788	1,599,658	0	0	0	0
2025	1,655,501	367,252	56,300	2,079,052	0	0	0	0	1,203,761	226,230	49,950	1,479,941	0	0	0	0
2026	1,539,193	351,478	48,523	1,939,194	0	0	0	0	1,108,590	215,098	42,407	1,366,096	0	0	0	0
2027	1,420,144	336,900	41,980	1,799,024	887,225	192,293	32,669	1,112,187	1,012,238	204,936	36,116	1,253,289	651,113	119,322	29,394	799,829
2028	1,301,163	322,710	36,542	1,660,415	1,714,976	375,919	60,819	2,151,714	915,287	195,026	30,933	1,141,246	1,252,993	232,437	54,369	1,539,800
2029	1,191,013	308,918	32,035	1,531,966	1,597,347	359,365	52,412	2,009,123	825,840	185,382	26,678	1,037,900	1,156,176	220,664	46,179	1,423,018
2030	1,090,954	295,578	28,351	1,414,884	1,479,668	344,189	45,252	1,869,109	744,668	176,054	23,216	943,938	1,060,414	210,017	39,262	1,309,692
2031	1,000,093	282,959	25,268	1,308,320	2,011,235	491,160	57,532	2,559,927	671,846	167,278	20,341	859,465	1,421,406	297,494	48,991	1,767,891
2032	921,487	270,816	22,648	1,214,952	1,191,013	308,918	32,035	1,531,966	608,368	158,840	17,915	785,123	825,840	185,382	26,678	1,037,900
2033	850,873	259,173	20,388	1,130,434	1,090,954	295,578	28,351	1,414,884	552,301	150,763	15,835	718,899	744,668	176,054	23,216	943,938
2034	786,948	248,024	18,410	1,053,383	1,000,093	282,959	25,268	1,308,320	502,251	143,045	14,025	659,321	671,846	167,278	20,341	859,465
2035	735,055	237,357	16,663	989,074	921,487	270,816	22,648	1,214,952	461,818	135,680	12,437	609,935	608,368	158,840	17,915	785,123
2036	688,271	227,167	15,115	930,552	850,873	259,173	20,388	1,130,434	425,691	128,668	11,037	565,395	552,301	150,763	15,835	718,899
2037	648,497	217,432	13,855	879,783	786,948	248,024	18,410	1,053,383	394,556	121,993	9,897	526,446	502,251	143,045	14,025	659,321
2038	615,504	208,140	12,711	836,355	735,055	237,357	16,663	989,074	369,702	115,649	8,868	494,220	461,818	135,680	12,437	609,935
2039	585,462	199,280	11,679	796,421	688,271	227,167	15,115	930,552	347,308	109,631	7,946	464,885	425,691	128,668	11,037	565,395
2040	557,327	190,933	10,738	758,998	648,497	217,432	13,855	879,783	326,469	103,995	7,109	437,573	394,556	121,993	9,897	526,446
2041	531,829	183,365	9,948	725,142	615,504	208,140	12,711	836,355	307,265	98,906	6,400	412,572	369,702	115,649	8,868	494,220
2042	508,249	176,212	9,250	693,712	585,462	199,280	11,679	796,421	289,578	94,121	5,775	389,473	347,308	109,631	7,946	464,885
2043	486,586	169,965	8,622	665,173	557,327	190,933	10,738	758,998	273,208	89,681	5,200	368,090	326,469	103,995	7,109	437,573

Notes: Col (1) - (3) from Exhibit E-77, Col (15), (30), etc.
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West Virginia Department of Environmental Protection Office of Special Reclamation
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Land Reclamation Cost Projection - Deterministic Model

					2024													
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Count	Released Permit Count	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Current Security Amount	Forfeited Security Amount	Net Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1965	Surface	Active	-	-	0.060%	0.00	0.821%	-	-	-	-	3,235.00	1.00	-	-	-	-
1966	Surface	Active	-	-	0.064%	0.00	0.855%	-	-	-	-	3,235.00	1.00	-	-	-	-
1967	Surface	Active	-	-	0.067%	0.00	0.891%	-	-	-	-	3,235.00	1.00	-	-	-	-
1968	Surface	Active	-	-	0.070%	0.00	0.928%	-	-	-	-	3,235.00	1.00	-	-	-	-
1969	Surface	Active	-	-	0.074%	0.00	0.967%	-	-	-	-	3,235.00	1.00	-	-	-	-
1970	Surface	Active	-	-	0.078%	0.00	1.007%	-	-	-	-	3,235.00	1.00	-	-	-	-
1971	Surface	Active	-	-	0.082%	0.00	1.049%	-	-	-	-	3,235.00	1.00	-	-	-	-
1972	Surface	Active	1	400.00	0.086%	1.25	1.092%	0.00	0.01	0.43	4.37	3,235.00	1.00	1,398.02	32,250.00	34.84	1,363.17
1973	Surface	Active	-	-	0.091%	0.00	1.138%	-	-	-	-	3,235.00	1.00	-	-	-	-
1974	Surface	Active	-	-	0.096%	0.00	1.185%	-	-	-	-	3,235.00	1.00	-	-	-	-
1975	Surface	Active	-	-	0.101%	0.00	1.235%	-	-	-	-	3,235.00	1.00	-	-	-	-
1976	Surface	Active	-	-	0.106%	0.00	1.286%	-	-	-	-	3,235.00	1.00	-	-	-	-
1977	Surface	Active	6	1,504.07	0.112%	1.02	1.340%	0.01	0.08	1.71	20.15	3,235.00	1.00	5,525.49	4,698,614.00	5,335.78	189.71
1978	Surface	Active	4	2,061.88	0.118%	0.90	1.396%	0.00	0.06	2.18	28.78	3,235.00	1.00	7,058.40	4,267,664.00	4,516.05	2,542.35
1979	Surface	Active	2	180.00	0.124%	0.90	1.454%	0.00	0.03	0.20	2.62	3,235.00	1.00	648.62	180,000.00	200.50	448.12
1980	Surface	Active	1	475.70	0.130%	0.90	1.552%	0.00	0.02	0.56	7.38	3,235.00	1.00	1,804.38	1,278,360.00	1,498.91	305.48
1981	Surface	Active	8	1,999.30	0.137%	0.94	1.644%	0.01	0.13	2.59	32.86	3,235.00	1.00	8,370.75	2,187,000.00	2,830.49	5,540.27
1982	Surface	Active	2	216.78	0.144%	0.90	1.729%	0.00	0.03	0.28	3.75	3,235.00	1.00	911.10	117,920.00	153.20	757.90
1983	Surface	Active	2	1,708.57	0.152%	0.90	1.809%	0.00	0.04	2.34	30.91	3,235.00	1.00	7,558.89	4,960,960.00	6,784.48	774.41
1984	Surface	Active	-	-	0.160%	0.00	1.883%	-	-	-	-	3,235.00	1.00	-	-	-	-
1985	Surface	Active	5	2,501.65	0.168%	0.76	1.950%	0.01	0.10	3.20	48.79	3,235.00	1.00	10,355.60	2,104,472.00	2,692.88	7,662.72
1986	Surface	Active	8	2,503.23	0.177%	0.99	2.012%	0.01	0.16	4.38	50.36	3,235.00	1.00	14,172.60	4,733,480.00	8,284.28	5,888.31
1987	Surface	Active	3	1,371.12	0.187%	1.02	2.067%	0.01	0.06	2.60	28.35	3,235.00	1.00	8,412.83	6,575,880.00	12,472.29	-
1988	Surface	Active	8	1,677.10	0.196%	0.86	2.117%	0.02	0.17	2.82	35.51	3,235.00	1.00	9,122.71	1,843,680.00	3,100.10	6,022.61
1989	Surface	Active	7	2,103.52	0.207%	0.90	2.161%	0.01	0.15	3.91	45.46	3,235.00	1.00	12,659.89	4,545,756.00	8,456.98	4,202.91
1990	Surface	Active	11	2,621.86	0.218%	0.84	2.199%	0.02	0.24	4.77	57.66	3,235.00	1.00	15,435.54	5,123,800.00	9,324.60	6,110.94
1991	Surface	Active	9	2,000.59	0.229%	0.98	2.232%	0.02	0.20	4.48	44.65	3,235.00	1.00	14,494.12	7,741,411.00	17,337.23	-
1992	Surface	Active	6	4,639.40	0.241%	0.90	2.259%	0.01	0.14	10.07	104.78	3,235.00	1.00	32,566.74	13,802,840.00	29,950.68	2,616.06
1993	Surface	Active	12	4,377.78	0.254%	0.90	2.280%	0.03	0.27	10.00	99.80	3,235.00	1.00	32,347.66	9,246,082.00	21,118.95	11,228.71
1994	Surface	Active	7	1,898.65	0.267%	0.75	2.295%	0.02	0.16	3.80	43.58	3,235.00	1.00	12,306.34	6,069,575.00	12,160.97	145.38
1995	Surface	Active	12	7,733.29	0.281%	0.96	2.305%	0.03	0.28	20.84	178.26	3,235.00	1.00	67,418.66	17,134,500.00	46,175.64	21,243.01
1996	Surface	Active	12	6,830.47	0.296%	0.99	2.309%	0.04	0.28	19.97	157.75	3,235.00	1.00	64,589.70	16,839,314.00	49,222.40	15,367.30
1997	Surface	Active	24	11,904.74	0.312%	0.96	2.308%	0.07	0.55	35.55	274.81	3,235.00	1.00	114,997.53	36,680,966.00	109,530.50	5,467.03
1998	Surface	Active	20	11,419.01	0.328%	0.87	2.302%	0.07	0.46	32.40	262.86	3,235.00	1.00	104,802.81	43,021,280.00	122,054.43	-
1999	Surface	Active	4	2,008.81	0.345%	0.81	2.290%	0.01	0.09	5.63	46.01	3,235.00	1.00	18,229.17	6,779,680.00	19,017.92	-
2000	Surface	Active	6	4,046.61	0.363%	0.84	2.273%	0.02	0.14	12.38	91.98	3,235.00	1.00	40,041.71	13,384,272.00	40,939.43	-
2001	Surface	Active	21	7,748.62	0.383%	0.93	2.251%	0.08	0.47	27.67	174.39	3,235.00	1.00	89,499.11	29,505,650.00	105,347.74	-
2002	Surface	Active	14	6,126.39	0.397%	0.93	2.223%	0.06	0.31	22.49	136.18	3,235.00	1.00	72,756.03	19,791,240.00	72,654.59	101.44
2003	Surface	Active	19	9,797.63	0.411%	0.92	2.190%	0.08	0.42	36.96	214.57	3,235.00	1.00	119,571.94	33,523,439.00	126,468.55	-
2004	Surface	Active	23	12,659.51	0.424%	0.93	2.152%	0.10	0.49	49.96	272.44	3,235.00	1.00	161,631.60	30,665,880.00	121,029.30	40,602.30
2005	Surface	Active	15	4,606.35	0.437%	1.04	2.109%	0.07	0.32	20.94	97.15	3,235.00	1.00	67,735.04	11,223,245.50	51,015.32	16,719.72
2006	Surface	Active	11	5,201.55	0.449%	0.96	2.061%	0.05	0.23	22.52	107.19	3,235.00	1.00	72,867.90	16,276,950.00	70,485.90	2,382.00
2007	Surface	Active	23	5,703.65	0.461%	0.93	2.008%	0.11	0.46	24.47	114.51	3,235.00	1.00	79,156.11	16,272,504.00	69,809.04	9,347.07
2008	Surface	Active	17	9,829.70	0.472%	0.86	1.950%	0.08	0.33	39.85	191.63	3,235.00	1.00	128,928.76	15,484,319.00	62,780.87	66,147.88
2009	Surface	Active	16	6,204.14	0.482%	0.88	1.887%	0.08	0.30	26.28	117.04	3,235.00	1.00	85,019.95	16,362,067.20	69,311.16	15,708.79
2010	Surface	Active	11	4,481.21	0.492%	1.00	1.819%	0.05	0.20	21.94	81.50	3,235.00	1.00	70,990.99	4,692,576.00	22,979.73	48,011.26
2011	Surface	Active	15	2,487.54	0.501%	0.85	1.746%	0.08	0.26	10.63	43.43	3,235.00	1.00	34,380.35	6,932,984.00	29,620.08	4,760.28
2012	Surface	Active	23	8,236.40	0.509%	0.92	1.668%	0.12	0.38	38.33	137.42	3,235.00	1.00	124,008.43	15,790,710.51	73,492.19	50,516.25
2013	Surface	Active	22	8,588.04	0.515%	0.96	1.586%	0.11	0.35	42.66	136.22	3,235.00	1.00	138,005.17	20,651,980.00	102,586.14	35,419.02
2014	Surface	Active	19	6,755.47	0.521%	0.83	1.499%	0.10	0.28	29.11	101.28	3,235.00	1.00	94,170.03	18,007,704.00	77,596.34	16,573.70
2015	Surface	Active	12	3,846.62	0.525%	0.90	1.412%	0.06	0.17	18.19	54.32	3,235.00	1.00	58,847.99	9,533,304.00	45,083.90	13,764.09
2016	Surface	Active	9	3,384.53	0.524%	0.86	1.309%	0.05	0.12	15.27	44.30	3,235.00	1.00	49,398.74	6,329,288.00	28,556.05	20,842.69
2017	Surface	Active	4	1,137.87	0.512%	1.08	1.189%	0.02	0.05	6.26	13.53	3,235.00	1.00	20,254.22	2,701,600.00	14,865.16	5,389.06
2018	Surface	Active	8	3,687.08	0.484%	1.03	1.046%	0.04	0.08	18.42	38.55	3,235.00	1.00	59,580.77	10,013,368.00	50,018.36	9,562.41
2019	Surface	Active	8	4,472.27	0.437%	0.94	0.873%	0.03	0.07	18.43	39.06	3,235.00	1.00	59,633.89	3,479,160.00	14,340.53	45,293.36
2020	Surface	Active	11	3,978.72	0.364%	0.74	0.666%	0.04	0.07	10.74	26.51	3,235.00	1.00	34,729.03	7,805,500.00	21,060.84	13,668.19
2021	Surface	Active	7	3,857.52	0.262%	0.85	0.418%	0.02	0.03	8.59	16.12	3,235.00	1.00	27,776.37	5,963,680.00	13,274.17	14,502.20
2022	Surface	Active	15	5,387.71	0.125%	1.04	0.122%	0.02	0.02	7.01	6.60	3,235.00	1.00	22,662.91	4,567,360.00	5,938.85	16,724.06
2023	Surface	Active	15	3,969.18	0.000%	0.99	0.000%	(0.00)	0.00	(0.00)	0.00	3,235.00	1.00	(0.00)	4,152,060.00	(0.00)	-

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					2024													
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Count	Released Permit Count	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Current Security Amount	Forfeited Security Amount	Net Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1965	Surface	Inactive	-	-	0.138%	0.00	0.483%	-	-	-	-	3,235.00	1.00	-	$0	-	-
1966	Surface	Inactive	-	-	0.145%	0.00	0.503%	-	-	-	-	3,235.00	1.00	-	-	-	-
1967	Surface	Inactive	-	-	0.153%	0.00	0.524%	-	-	-	-	3,235.00	1.00	-	-	-	-
1968	Surface	Inactive	-	-	0.161%	0.00	0.546%	-	-	-	-	3,235.00	1.00	-	-	-	-
1969	Surface	Inactive	-	-	0.169%	0.00	0.569%	-	-	-	-	3,235.00	1.00	-	-	-	-
1970	Surface	Inactive	-	-	0.178%	0.00	0.592%	-	-	-	-	3,235.00	1.00	-	-	-	-
1971	Surface	Inactive	-	-	0.188%	0.00	0.617%	-	-	-	-	3,235.00	1.00	-	-	-	-
1972	Surface	Inactive	-	-	0.198%	0.00	0.643%	-	-	-	-	3,235.00	1.00	-	-	-	-
1973	Surface	Inactive	-	-	0.208%	0.00	0.669%	-	-	-	-	3,235.00	1.00	-	-	-	-
1974	Surface	Inactive	-	-	0.219%	0.00	0.697%	-	-	-	-	3,235.00	1.00	-	-	-	-
1975	Surface	Inactive	-	-	0.230%	0.00	0.726%	-	-	-	-	3,235.00	1.00	-	-	-	-
1976	Surface	Inactive	1	438.80	0.243%	0.55	0.757%	0.00	0.01	0.59	3.32	3,235.00	1.00	1,893.65	442,000.00	589.63	1,304.02
1977	Surface	Inactive	-	-	0.255%	0.00	0.788%	-	-	-	-	3,235.00	1.00	-	-	-	-
1978	Surface	Inactive	-	-	0.269%	0.00	0.821%	-	-	-	-	3,235.00	1.00	-	-	-	-
1979	Surface	Inactive	-	-	0.283%	0.00	0.855%	-	-	-	-	3,235.00	1.00	-	-	-	-
1980	Surface	Inactive	-	-	0.298%	0.00	0.913%	-	-	-	-	3,235.00	1.00	-	-	-	-
1981	Surface	Inactive	-	-	0.313%	0.00	0.967%	-	-	-	-	3,235.00	1.00	-	-	-	-
1982	Surface	Inactive	-	-	0.330%	0.00	1.017%	-	-	-	-	3,235.00	1.00	-	-	-	-
1983	Surface	Inactive	-	-	0.347%	0.00	1.064%	-	-	-	-	3,235.00	1.00	-	-	-	-
1984	Surface	Inactive	-	-	0.366%	0.00	1.107%	-	-	-	-	3,235.00	1.00	-	-	-	-
1985	Surface	Inactive	-	-	0.385%	0.00	1.147%	-	-	-	-	3,235.00	1.00	-	-	-	-
1986	Surface	Inactive	1	411.07	0.405%	0.90	1.183%	0.00	0.01	1.50	4.86	3,235.00	1.00	4,848.33	759,360.00	2,768.53	2,079.79
1987	Surface	Inactive	2	415.61	0.426%	1.08	1.216%	0.01	0.02	1.91	5.05	3,235.00	1.00	6,163.17	992,200.00	4,548.24	1,614.93
1988	Surface	Inactive	1	1,304.38	0.449%	0.90	1.245%	0.00	0.01	5.27	16.25	3,235.00	1.00	17,046.41	2,142,480.00	8,655.09	8,391.33
1989	Surface	Inactive	2	176.00	0.472%	0.90	1.271%	0.01	0.03	0.75	2.24	3,235.00	1.00	2,421.13	352,000.00	1,496.83	924.30
1990	Surface	Inactive	1	70.12	0.497%	0.55	1.294%	0.00	0.01	0.19	0.91	3,235.00	1.00	620.50	240,240.00	657.16	-
1991	Surface	Inactive	-	-	0.524%	0.00	1.313%	-	-	-	-	3,235.00	1.00	-	-	-	-
1992	Surface	Inactive	-	-	0.551%	0.00	1.329%	-	-	-	-	3,235.00	1.00	-	-	-	-
1993	Surface	Inactive	-	-	0.580%	0.00	1.341%	-	-	-	-	3,235.00	1.00	-	-	-	-
1994	Surface	Inactive	-	-	0.611%	0.00	1.350%	-	-	-	-	3,235.00	1.00	-	-	-	-
1995	Surface	Inactive	2	2,098.71	0.643%	0.90	1.356%	0.01	0.03	12.14	28.46	3,235.00	1.00	39,274.99	5,382,120.00	31,134.56	8,140.43
1996	Surface	Inactive	-	-	0.677%	0.00	1.359%	-	-	-	-	3,235.00	1.00	-	-	-	-
1997	Surface	Inactive	-	-	0.712%	0.00	1.358%	-	-	-	-	3,235.00	1.00	-	-	-	-
1998	Surface	Inactive	1	846.89	0.750%	0.90	1.354%	0.01	0.01	5.71	11.47	3,235.00	1.00	18,485.02	4,041,240.00	27,266.74	-
1999	Surface	Inactive	1	1,733.11	0.789%	1.25	1.347%	0.01	0.01	17.10	23.35	3,235.00	1.00	55,304.80	25,000.00	246.61	55,058.20
2000	Surface	Inactive	-	-	0.831%	0.00	1.337%	-	-	-	-	3,235.00	1.00	-	-	-	-
2001	Surface	Inactive	-	-	0.874%	0.00	1.324%	-	-	-	-	3,235.00	1.00	-	-	-	-
2002	Surface	Inactive	3	1,146.85	0.907%	0.78	1.308%	0.03	0.04	8.15	15.00	3,235.00	1.00	26,363.18	6,165,760.00	43,813.05	-
2003	Surface	Inactive	1	1,161.50	0.939%	0.90	1.288%	0.01	0.01	9.81	14.96	3,235.00	1.00	31,750.47	5,050,380.00	42,675.70	-
2004	Surface	Inactive	3	3,700.97	0.970%	0.90	1.266%	0.03	0.04	32.29	46.85	3,235.00	1.00	104,472.86	16,262,680.00	141,907.63	-
2005	Surface	Inactive	-	-	0.999%	0.00	1.241%	-	-	-	-	3,235.00	1.00	-	-	-	-
2006	Surface	Inactive	1	244.59	1.027%	0.55	1.212%	0.01	0.01	1.38	2.97	3,235.00	1.00	4,470.06	294,402.00	1,663.19	2,806.87
2007	Surface	Inactive	1	1,080.24	1.054%	0.55	1.181%	0.01	0.01	6.26	12.76	3,235.00	1.00	20,255.85	229,000.00	1,327.37	18,928.48
2008	Surface	Inactive	1	118.60	1.079%	1.25	1.147%	0.01	0.01	1.60	1.36	3,235.00	1.00	5,175.14	91,028.69	1,227.84	3,947.30
2009	Surface	Inactive	3	680.43	1.103%	0.55	1.110%	0.03	0.03	4.13	7.55	3,235.00	1.00	13,349.07	1,072,084.00	6,501.63	6,847.44
2010	Surface	Inactive	2	1,146.11	1.124%	1.08	1.070%	0.02	0.02	13.85	12.26	3,235.00	1.00	44,817.05	3,756,040.00	45,401.78	-
2011	Surface	Inactive	3	1,088.67	1.144%	0.78	1.027%	0.03	0.03	9.76	11.18	3,235.00	1.00	31,570.86	3,612,480.00	32,383.31	-
2012	Surface	Inactive	-	-	1.162%	0.00	0.981%	-	-	-	-	3,235.00	1.00	-	-	-	-
2013	Surface	Inactive	1	93.44	1.178%	0.55	0.933%	0.01	0.01	0.61	0.87	3,235.00	1.00	1,958.87	263,200.00	1,705.63	253.24
2014	Surface	Inactive	2	415.42	1.192%	0.90	0.882%	0.02	0.02	4.46	3.66	3,235.00	1.00	14,416.60	354,960.00	3,807.86	10,608.75
2015	Surface	Inactive	3	1,156.30	1.201%	0.67	0.831%	0.04	0.02	9.26	9.61	3,235.00	1.00	29,950.98	951,240.00	7,616.52	22,334.46
2016	Surface	Inactive	2	776.75	1.198%	0.73	0.770%	0.02	0.02	6.74	5.98	3,235.00	1.00	21,817.23	2,719,440.00	23,611.49	-
2017	Surface	Inactive	1	154.63	1.170%	0.90	0.699%	0.01	0.01	1.63	1.08	3,235.00	1.00	5,267.11	630,000.00	6,633.54	-
2018	Surface	Inactive	1	351.08	1.107%	0.90	0.615%	0.01	0.01	3.50	2.16	3,235.00	1.00	11,316.97	569,400.00	5,673.71	5,643.26
2019	Surface	Inactive	1	452.10	0.998%	0.90	0.514%	0.01	0.01	4.06	2.32	3,235.00	1.00	13,140.36	510,000.00	4,582.14	8,558.21
2020	Surface	Inactive	-	-	0.832%	0.00	0.392%	-	-	-	-	3,235.00	1.00	-	-	-	-
2021	Surface	Inactive	-	-	0.599%	0.00	0.246%	-	-	-	-	3,235.00	1.00	-	-	-	-
2022	Surface	Inactive	-	-	0.286%	0.00	0.072%	-	-	-	-	3,235.00	1.00	-	-	-	-
2023	Surface	Inactive	-	-	0.000%	0.00	0.000%	-	-	-	-	3,235.00	1.00	-	-	-	-

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Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Surface	Phased Released	-	-	0.160%	0.00	2.221%	-	-	-	-	3,235.00	0.50	-	-	-	-
1966	Surface	Phased Released	-	-	0.168%	0.00	2.314%	-	-	-	-	3,235.00	0.50	-	-	-	-
1967	Surface	Phased Released	-	-	0.177%	0.00	2.410%	-	-	-	-	3,235.00	0.50	-	-	-	-
1968	Surface	Phased Released	-	-	0.186%	0.00	2.511%	-	-	-	-	3,235.00	0.50	-	-	-	-
1969	Surface	Phased Released	-	-	0.196%	0.00	2.615%	-	-	-	-	3,235.00	0.50	-	-	-	-
1970	Surface	Phased Released	-	-	0.206%	0.00	2.724%	-	-	-	-	3,235.00	0.50	-	-	-	-
1971	Surface	Phased Released	-	-	0.217%	0.00	2.838%	-	-	-	-	3,235.00	0.50	-	-	-	-
1972	Surface	Phased Released	-	-	0.228%	0.00	2.956%	-	-	-	-	3,235.00	0.50	-	-	-	-
1973	Surface	Phased Released	-	-	0.240%	0.00	3.079%	-	-	-	-	3,235.00	0.50	-	-	-	-
1974	Surface	Phased Released	2	189.60	0.253%	1.25	3.208%	0.01	0.06	0.60	6.08	3,235.00	0.50	970.26	98,250.00	310.84	659.42
1975	Surface	Phased Released	2	7.80	0.266%	1.25	3.341%	0.01	0.07	0.03	0.26	3,235.00	0.50	42.02	30,600.00	101.91	-
1976	Surface	Phased Released	5	626.17	0.280%	1.25	3.480%	0.01	0.17	2.20	21.79	3,235.00	0.50	3,550.53	112,250.00	393.50	3,157.04
1977	Surface	Phased Released	2	48.00	0.295%	1.25	3.625%	0.01	0.07	0.18	1.74	3,235.00	0.50	286.50	14,750.00	54.43	232.07
1978	Surface	Phased Released	2	158.81	0.311%	1.25	3.777%	0.01	0.08	0.62	6.00	3,235.00	0.50	997.77	50,000.00	194.21	803.56
1979	Surface	Phased Released	2	358.00	0.327%	1.25	3.934%	0.01	0.08	1.46	14.08	3,235.00	0.50	2,367.63	122,400.00	500.46	1,867.17
1980	Surface	Phased Released	1	253.42	0.344%	1.25	4.199%	0.00	0.04	1.09	10.64	3,235.00	0.50	1,764.20	64,750.00	278.68	1,485.52
1981	Surface	Phased Released	7	1,785.41	0.362%	1.00	4.448%	0.03	0.31	6.47	79.41	3,235.00	0.50	10,466.74	1,571,520.00	5,695.72	4,771.01
1982	Surface	Phased Released	-	-	0.382%	0.00	4.680%	-	-	-	-	3,235.00	0.50	-	-	-	-
1983	Surface	Phased Released	5	302.61	0.402%	1.25	4.895%	0.02	0.24	1.52	14.81	3,235.00	0.50	2,457.08	169,802.37	852.38	1,604.70
1984	Surface	Phased Released	4	2,585.75	0.423%	1.08	5.094%	0.02	0.20	11.75	131.72	3,235.00	0.50	19,006.30	2,241,760.00	10,187.22	8,819.07
1985	Surface	Phased Released	2	1,270.29	0.445%	0.90	5.277%	0.01	0.11	5.09	67.03	3,235.00	0.50	8,228.57	349,670.00	1,400.35	6,828.22
1986	Surface	Phased Released	4	1,041.15	0.468%	0.90	5.444%	0.02	0.22	4.39	56.68	3,235.00	0.50	7,099.23	545,288.00	2,298.69	4,800.54
1987	Surface	Phased Released	4	760.81	0.493%	0.90	5.594%	0.02	0.22	3.38	42.56	3,235.00	0.50	5,460.73	442,636.00	1,964.16	3,496.57
1988	Surface	Phased Released	5	478.00	0.519%	1.25	5.729%	0.03	0.29	3.10	27.38	3,235.00	0.50	5,015.87	111,000.00	720.11	4,295.76
1989	Surface	Phased Released	5	1,098.64	0.546%	1.11	5.848%	0.03	0.29	6.66	64.25	3,235.00	0.50	10,776.13	254,550.00	1,543.61	9,232.53
1990	Surface	Phased Released	4	764.18	0.575%	1.25	5.951%	0.02	0.24	5.49	45.48	3,235.00	0.50	8,885.19	212,376.00	1,526.62	7,358.56
1991	Surface	Phased Released	5	1,006.45	0.605%	0.97	6.039%	0.03	0.30	5.91	60.78	3,235.00	0.50	9,558.75	537,148.00	3,153.98	6,404.77
1992	Surface	Phased Released	-	-	0.637%	0.00	6.111%	-	-	-	-	3,235.00	0.50	-	-	-	-
1993	Surface	Phased Released	1	562.59	0.671%	1.25	6.168%	0.01	0.06	4.72	34.70	3,235.00	0.50	7,629.43	37,350.00	313.15	7,316.28
1994	Surface	Phased Released	5	386.03	0.706%	0.90	6.210%	0.04	0.31	2.45	23.97	3,235.00	0.50	3,967.62	1,136,483.00	7,221.50	-
1995	Surface	Phased Released	3	484.30	0.743%	1.13	6.237%	0.02	0.19	4.08	30.21	3,235.00	0.50	6,598.04	563,096.00	4,742.84	1,855.20
1996	Surface	Phased Released	4	675.12	0.782%	0.90	6.249%	0.03	0.25	4.75	42.19	3,235.00	0.50	7,688.52	727,285.00	5,120.62	2,567.91
1997	Surface	Phased Released	2	969.50	0.823%	1.08	6.246%	0.02	0.12	8.58	60.56	3,235.00	0.50	13,882.00	1,568,000.00	13,880.53	1.47
1998	Surface	Phased Released	3	511.73	0.867%	0.78	6.229%	0.03	0.19	3.47	31.88	3,235.00	0.50	5,620.30	581,056.00	3,945.41	1,674.89
1999	Surface	Phased Released	1	14.87	0.912%	1.25	6.197%	0.01	0.06	0.17	0.92	3,235.00	0.50	274.33	10,640.00	121.35	152.97
2000	Surface	Phased Released	1	19.70	0.960%	1.25	6.151%	0.01	0.06	0.24	1.21	3,235.00	0.50	382.56	-	-	382.56
2001	Surface	Phased Released	3	491.55	1.011%	1.02	6.090%	0.03	0.18	5.05	29.93	3,235.00	0.50	8,172.36	493,244.06	5,069.88	3,102.48
2002	Surface	Phased Released	2	154.49	1.049%	1.25	6.015%	0.02	0.12	2.03	9.29	3,235.00	0.50	3,276.25	142,806.00	1,872.31	1,403.93
2003	Surface	Phased Released	1	-	1.086%	1.25	5.926%	0.01	0.06	-	-	3,235.00	0.50	-	-	-	-
2004	Surface	Phased Released	2	470.13	1.121%	1.08	5.823%	0.02	0.12	5.67	27.38	3,235.00	0.50	9,164.18	596,000.00	7,182.53	1,981.65
2005	Surface	Phased Released	1	51.50	1.155%	1.25	5.707%	0.01	0.06	0.74	2.94	3,235.00	0.50	1,202.77	39,520.00	570.62	632.15
2006	Surface	Phased Released	1	60.78	1.188%	1.25	5.576%	0.01	0.06	0.90	3.39	3,235.00	0.50	1,459.50	49,200.00	730.41	729.10
2007	Surface	Phased Released	1	186.68	1.219%	0.55	5.433%	0.01	0.05	1.25	10.14	3,235.00	0.50	2,023.72	141,840.00	950.62	1,073.10
2008	Surface	Phased Released	-	-	1.248%	0.00	5.275%	-	-	-	-	3,235.00	0.50	-	-	-	-
2009	Surface	Phased Released	2	220.84	1.275%	0.90	5.105%	0.03	0.10	2.53	11.27	3,235.00	0.50	4,098.71	228,336.00	2,619.99	1,478.72
2010	Surface	Phased Released	-	-	1.300%	0.00	4.921%	-	-	-	-	3,235.00	0.50	-	-	-	-
2011	Surface	Phased Released	2	214.01	1.323%	1.25	4.724%	0.03	0.09	3.54	10.11	3,235.00	0.50	5,725.45	115,616.00	1,912.27	3,813.18
2012	Surface	Phased Released	-	-	1.344%	0.00	4.514%	-	-	-	-	3,235.00	0.50	-	-	-	-
2013	Surface	Phased Released	-	-	1.362%	0.00	4.292%	-	-	-	-	3,235.00	0.50	-	-	-	-
2014	Surface	Phased Released	1	27.91	1.378%	1.25	4.057%	0.01	0.04	0.48	1.13	3,235.00	0.50	777.72	20,800.00	358.33	419.39
2015	Surface	Phased Released	-	-	1.389%	0.00	3.821%	-	-	-	-	3,235.00	0.50	-	-	-	-
2016	Surface	Phased Released	-	-	1.385%	0.00	3.542%	-	-	-	-	3,235.00	0.50	-	-	-	-
2017	Surface	Phased Released	-	-	1.353%	0.00	3.216%	-	-	-	-	3,235.00	0.50	-	-	-	-
2018	Surface	Phased Released	-	-	1.280%	0.00	2.829%	-	-	-	-	3,235.00	0.50	-	-	-	-
2019	Surface	Phased Released	-	-	1.154%	0.00	2.363%	-	-	-	-	3,235.00	0.50	-	-	-	-
2020	Surface	Phased Released	-	-	0.962%	0.00	1.803%	-	-	-	-	3,235.00	0.50	-	-	-	-
2021	Surface	Phased Released	-	-	0.692%	0.00	1.131%	-	-	-	-	3,235.00	0.50	-	-	-	-
2022	Surface	Phased Released	-	-	0.330%	0.00	0.331%	-	-	-	-	3,235.00	0.50	-	-	-	-
2023	Surface	Phased Released	-	-	0.000%	0.00	0.000%	-	-	-	-	3,235.00	0.50	-	-	-	-

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					2024													
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Underground	Active	-	-	0.101%	0.00	0.594%	-	-	-	-	13,295.00	1.00	-	-	-	-
1966	Underground	Active	-	-	0.104%	0.00	0.619%	-	-	-	-	13,295.00	1.00	-	-	-	-
1967	Underground	Active	-	-	0.107%	0.00	0.645%	-	-	-	-	13,295.00	1.00	-	-	-	-
1968	Underground	Active	-	-	0.109%	0.00	0.672%	-	-	-	-	13,295.00	1.00	-	-	-	-
1969	Underground	Active	-	-	0.112%	0.00	0.700%	-	-	-	-	13,295.00	1.00	-	-	-	-
1970	Underground	Active	-	-	0.115%	0.00	0.729%	-	-	-	-	13,295.00	1.00	-	-	-	-
1971	Underground	Active	-	-	0.118%	0.00	0.759%	-	-	-	-	13,295.00	1.00	-	-	-	-
1972	Underground	Active	-	-	0.121%	0.00	0.791%	-	-	-	-	13,295.00	1.00	-	-	-	-
1973	Underground	Active	-	-	0.124%	0.00	0.824%	-	-	-	-	13,295.00	1.00	-	-	-	-
1974	Underground	Active	-	-	0.127%	0.00	0.858%	-	-	-	-	13,295.00	1.00	-	-	-	-
1975	Underground	Active	-	-	0.131%	0.00	0.894%	-	-	-	-	13,295.00	1.00	-	-	-	-
1976	Underground	Active	-	-	0.134%	0.00	0.931%	-	-	-	-	13,295.00	1.00	-	-	-	-
1977	Underground	Active	-	-	0.137%	0.00	0.970%	-	-	-	-	13,295.00	1.00	-	-	-	-
1978	Underground	Active	-	-	0.141%	0.00	1.076%	-	-	-	-	13,295.00	1.00	-	-	-	-
1979	Underground	Active	8	755.59	0.145%	1.03	1.183%	0.01	0.09	1.13	8.94	13,295.00	1.00	14,973.58	4,969,512.00	7,407.39	7,566.20
1980	Underground	Active	5	222.16	0.148%	0.97	1.290%	0.01	0.06	0.32	2.87	13,295.00	1.00	4,247.26	476,640.00	685.40	3,561.86
1981	Underground	Active	17	720.89	0.152%	1.17	1.397%	0.03	0.24	1.28	10.07	13,295.00	1.00	17,015.59	4,014,640.00	7,127.48	9,888.10
1982	Underground	Active	3	80.68	0.156%	1.02	1.503%	0.00	0.05	0.13	1.21	13,295.00	1.00	1,700.62	255,520.00	405.11	1,295.50
1983	Underground	Active	29	7,126.06	0.160%	0.91	1.609%	0.05	0.47	10.40	114.64	13,295.00	1.00	138,208.34	31,680,303.43	46,215.30	91,993.04
1984	Underground	Active	17	2,930.46	0.164%	1.02	1.713%	0.03	0.29	4.92	50.19	13,295.00	1.00	65,416.70	13,453,220.00	22,588.67	42,828.02
1985	Underground	Active	3	49.00	0.168%	1.25	1.815%	0.01	0.05	0.10	0.89	13,295.00	1.00	1,370.11	138,280.00	290.82	1,079.28
1986	Underground	Active	5	252.11	0.173%	1.11	1.915%	0.01	0.10	0.48	4.83	13,295.00	1.00	6,420.31	406,240.00	778.15	5,642.17
1987	Underground	Active	5	203.45	0.177%	1.11	2.013%	0.01	0.10	0.40	4.10	13,295.00	1.00	5,313.97	400,160.00	786.15	4,527.82
1988	Underground	Active	5	179.01	0.182%	1.11	2.108%	0.01	0.11	0.36	3.77	13,295.00	1.00	4,795.50	505,062.00	1,017.68	3,777.82
1989	Underground	Active	9	124.25	0.186%	1.25	2.199%	0.02	0.20	0.29	2.73	13,295.00	1.00	3,844.46	264,309.00	615.12	3,229.34
1990	Underground	Active	4	131.40	0.191%	1.08	2.287%	0.01	0.09	0.27	3.01	13,295.00	1.00	3,586.15	305,240.00	626.59	2,959.56
1991	Underground	Active	3	35.30	0.196%	1.25	2.370%	0.01	0.07	0.09	0.84	13,295.00	1.00	1,148.96	73,520.00	179.99	968.97
1992	Underground	Active	12	1,073.06	0.201%	0.96	2.449%	0.02	0.29	2.07	26.28	13,295.00	1.00	27,463.52	5,922,375.83	11,400.92	16,062.60
1993	Underground	Active	12	974.28	0.206%	1.02	2.523%	0.02	0.30	2.04	24.58	13,295.00	1.00	27,131.47	2,677,680.00	5,608.67	21,522.80
1994	Underground	Active	12	756.33	0.211%	0.99	2.592%	0.03	0.31	1.58	19.60	13,295.00	1.00	20,982.38	1,902,184.00	3,969.24	17,013.14
1995	Underground	Active	6	273.19	0.224%	1.02	2.655%	0.01	0.16	0.62	7.25	13,295.00	1.00	8,271.83	691,160.00	1,574.08	6,697.75
1996	Underground	Active	10	242.74	0.237%	1.04	2.711%	0.02	0.27	0.60	6.58	13,295.00	1.00	7,939.23	692,496.00	1,703.59	6,235.64
1997	Underground	Active	13	239.17	0.249%	1.09	2.761%	0.03	0.36	0.65	6.60	13,295.00	1.00	8,613.14	776,800.93	2,104.15	6,508.99
1998	Underground	Active	12	558.33	0.261%	0.99	2.804%	0.03	0.34	1.44	15.66	13,295.00	1.00	19,124.22	1,851,364.00	4,769.76	14,354.46
1999	Underground	Active	8	117.00	0.273%	1.25	2.840%	0.02	0.23	0.40	3.32	13,295.00	1.00	5,300.47	294,440.00	1,003.31	4,297.16
2000	Underground	Active	8	281.79	0.284%	1.08	2.868%	0.02	0.23	0.86	8.08	13,295.00	1.00	11,434.75	640,680.00	1,955.48	9,479.26
2001	Underground	Active	5	224.71	0.295%	0.83	2.887%	0.01	0.14	0.55	6.49	13,295.00	1.00	7,310.22	665,160.00	1,627.59	5,682.62
2002	Underground	Active	8	265.26	0.305%	1.16	2.898%	0.02	0.23	0.94	7.69	13,295.00	1.00	12,512.35	771,760.00	2,738.17	9,774.17
2003	Underground	Active	11	998.12	0.315%	1.15	2.900%	0.03	0.32	3.63	28.95	13,295.00	1.00	48,267.56	4,405,880.00	16,025.70	32,241.86
2004	Underground	Active	7	460.97	0.324%	1.00	2.893%	0.02	0.20	1.49	13.33	13,295.00	1.00	19,874.36	8,885,339.00	28,814.18	-
2005	Underground	Active	7	325.84	0.333%	0.95	2.875%	0.02	0.20	1.03	9.37	13,295.00	1.00	13,699.37	994,100.00	3,143.68	10,555.69
2006	Underground	Active	10	433.77	0.341%	0.83	2.848%	0.03	0.28	1.23	12.35	13,295.00	1.00	16,310.60	1,295,640.00	3,664.43	12,646.17
2007	Underground	Active	12	594.07	0.348%	1.10	2.810%	0.04	0.34	2.28	16.69	13,295.00	1.00	30,337.50	9,229,820.00	35,452.52	-
2008	Underground	Active	5	107.24	0.354%	1.25	2.760%	0.02	0.14	0.47	2.96	13,295.00	1.00	6,311.99	284,440.00	1,259.25	5,052.74
2009	Underground	Active	6	344.39	0.360%	0.90	2.700%	0.02	0.16	1.11	9.30	13,295.00	1.00	14,818.20	789,800.00	2,556.07	12,262.12
2010	Underground	Active	8	241.30	0.364%	1.16	2.627%	0.03	0.21	1.02	6.34	13,295.00	1.00	13,578.55	397,040.00	1,680.51	11,898.03
2011	Underground	Active	7	201.31	0.368%	1.15	2.543%	0.03	0.18	0.85	5.12	13,295.00	1.00	11,314.72	582,960.00	2,464.50	8,850.22
2012	Underground	Active	7	220.12	0.370%	1.05	2.445%	0.03	0.17	0.86	5.38	13,295.00	1.00	11,372.48	509,120.00	1,978.46	9,394.02
2013	Underground	Active	14	495.72	0.371%	1.03	2.335%	0.05	0.33	1.89	11.57	13,295.00	1.00	25,095.87	1,333,320.00	5,077.05	20,018.81
2014	Underground	Active	22	752.00	0.372%	1.06	2.211%	0.08	0.49	2.96	16.63	13,295.00	1.00	39,363.09	1,448,440.00	5,702.74	33,660.35
2015	Underground	Active	7	157.00	0.369%	1.15	2.073%	0.03	0.15	0.67	3.25	13,295.00	1.00	8,853.74	343,600.00	1,457.44	7,396.30
2016	Underground	Active	5	135.36	0.364%	1.25	1.921%	0.02	0.10	0.62	2.60	13,295.00	1.00	8,179.44	321,800.00	1,462.62	6,716.83
2017	Underground	Active	7	161.03	0.351%	1.25	1.754%	0.02	0.12	0.71	2.82	13,295.00	1.00	9,398.89	169,120.00	742.47	8,656.43
2018	Underground	Active	4	52.55	0.329%	1.25	1.572%	0.01	0.06	0.22	0.83	13,295.00	1.00	2,870.58	145,360.00	597.25	2,273.33
2019	Underground	Active	4	149.13	0.293%	1.08	1.375%	0.01	0.06	0.47	2.05	13,295.00	1.00	6,247.26	388,840.00	1,225.20	5,022.06
2020	Underground	Active	7	126.64	0.241%	1.25	1.162%	0.02	0.08	0.38	1.47	13,295.00	1.00	5,082.28	302,840.00	914.14	4,168.14
2021	Underground	Active	7	76.97	0.171%	1.25	0.932%	0.01	0.07	0.16	0.72	13,295.00	1.00	2,185.69	210,480.00	449.56	1,736.13
2022	Underground	Active	4	43.22	0.078%	1.25	0.686%	0.00	0.03	0.04	0.30	13,295.00	1.00	562.48	103,800.00	101.61	460.87
2023	Underground	Active	3	69.14	0.000%	1.25	0.423%	(0.00)	0.01	(0.00)	0.29	13,295.00	1.00	(0.00)	148,000.00	(0.00)	-

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Land Reclamation Cost Projection - Deterministic Model

					2024													
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Underground	Inactive	-	-	0.232%	0.00	0.350%	-	-	-	-	13,295.00	1.00	-	$0	-	-
1966	Underground	Inactive	-	-	0.238%	0.00	0.364%	-	-	-	-	13,295.00	1.00	-	-	-	-
1967	Underground	Inactive	-	-	0.244%	0.00	0.379%	-	-	-	-	13,295.00	1.00	-	-	-	-
1968	Underground	Inactive	-	-	0.250%	0.00	0.395%	-	-	-	-	13,295.00	1.00	-	-	-	-
1969	Underground	Inactive	-	-	0.256%	0.00	0.412%	-	-	-	-	13,295.00	1.00	-	-	-	-
1970	Underground	Inactive	-	-	0.263%	0.00	0.429%	-	-	-	-	13,295.00	1.00	-	-	-	-
1971	Underground	Inactive	-	-	0.270%	0.00	0.447%	-	-	-	-	13,295.00	1.00	-	-	-	-
1972	Underground	Inactive	-	-	0.277%	0.00	0.465%	-	-	-	-	13,295.00	1.00	-	-	-	-
1973	Underground	Inactive	-	-	0.284%	0.00	0.485%	-	-	-	-	13,295.00	1.00	-	-	-	-
1974	Underground	Inactive	-	-	0.291%	0.00	0.505%	-	-	-	-	13,295.00	1.00	-	-	-	-
1975	Underground	Inactive	-	-	0.299%	0.00	0.526%	-	-	-	-	13,295.00	1.00	-	-	-	-
1976	Underground	Inactive	1	26.50	0.306%	0.55	0.548%	0.00	0.01	0.04	0.15	13,295.00	1.00	593.36	345,280.00	581.51	11.85
1977	Underground	Inactive	-	-	0.314%	0.00	0.571%	-	-	-	-	13,295.00	1.00	-	-	-	-
1978	Underground	Inactive	2	117.89	0.322%	0.55	0.633%	0.01	0.01	0.21	0.75	13,295.00	1.00	2,776.78	504,898.00	894.50	1,882.28
1979	Underground	Inactive	-	-	0.330%	0.00	0.696%	-	-	-	-	13,295.00	1.00	-	-	-	-
1980	Underground	Inactive	-	-	0.339%	0.00	0.759%	-	-	-	-	13,295.00	1.00	-	-	-	-
1981	Underground	Inactive	4	189.58	0.348%	0.73	0.822%	0.01	0.03	0.48	1.56	13,295.00	1.00	6,350.66	820,330.00	2,066.93	4,283.73
1982	Underground	Inactive	1	72.51	0.356%	0.55	0.884%	0.00	0.01	0.14	0.64	13,295.00	1.00	1,889.92	206,640.00	405.11	1,484.81
1983	Underground	Inactive	6	285.25	0.366%	0.78	0.946%	0.02	0.06	0.82	2.70	13,295.00	1.00	10,860.54	857,297.00	2,455.10	8,405.44
1984	Underground	Inactive	-	-	0.375%	0.00	1.008%	-	-	-	-	13,295.00	1.00	-	-	-	-
1985	Underground	Inactive	1	220.21	0.385%	0.90	1.068%	0.00	0.01	0.76	2.35	13,295.00	1.00	10,133.26	574,600.00	1,988.79	8,144.47
1986	Underground	Inactive	1	43.54	0.394%	0.55	1.127%	0.00	0.01	0.09	0.49	13,295.00	1.00	1,255.79	291,298.00	631.94	623.85
1987	Underground	Inactive	1	40.89	0.405%	0.55	1.184%	0.00	0.01	0.09	0.48	13,295.00	1.00	1,209.60	160,756.00	357.69	851.91
1988	Underground	Inactive	6	73.42	0.415%	1.19	1.240%	0.02	0.07	0.36	0.91	13,295.00	1.00	4,826.42	1,198,546.00	5,926.21	-
1989	Underground	Inactive	2	193.50	0.426%	0.55	1.294%	0.01	0.03	0.45	2.50	13,295.00	1.00	6,021.37	613,387.00	1,435.69	4,585.68
1990	Underground	Inactive	4	47.64	0.436%	1.08	1.345%	0.02	0.05	0.22	0.64	13,295.00	1.00	2,971.85	231,443.00	1,085.95	1,885.90
1991	Underground	Inactive	3	362.42	0.448%	1.02	1.394%	0.01	0.04	1.65	5.05	13,295.00	1.00	21,929.71	1,482,676.00	6,748.06	15,181.65
1992	Underground	Inactive	1	9.00	0.459%	1.25	1.441%	0.00	0.01	0.05	0.13	13,295.00	1.00	686.74	21,240.00	121.90	564.83
1993	Underground	Inactive	2	35.86	0.471%	0.90	1.484%	0.01	0.03	0.15	0.53	13,295.00	1.00	2,020.62	429,518.00	1,820.41	200.22
1994	Underground	Inactive	2	100.78	0.483%	0.55	1.525%	0.01	0.03	0.27	1.54	13,295.00	1.00	3,559.31	289,680.00	769.52	2,789.78
1995	Underground	Inactive	6	182.46	0.512%	0.67	1.561%	0.03	0.09	0.62	2.85	13,295.00	1.00	8,280.50	1,484,496.54	5,067.34	3,213.16
1996	Underground	Inactive	3	55.21	0.541%	1.25	1.595%	0.02	0.05	0.37	0.88	13,295.00	1.00	4,960.82	129,280.00	873.73	4,087.09
1997	Underground	Inactive	6	282.76	0.569%	1.02	1.624%	0.03	0.10	1.64	4.59	13,295.00	1.00	21,740.02	1,569,441.00	9,076.09	12,663.94
1998	Underground	Inactive	1	72.14	0.596%	0.90	1.649%	0.01	0.02	0.39	1.19	13,295.00	1.00	5,147.50	580,678.20	3,116.50	2,031.00
1999	Underground	Inactive	10	606.66	0.623%	1.11	1.670%	0.06	0.17	4.20	10.13	13,295.00	1.00	55,783.90	1,809,283.00	12,513.58	43,270.32
2000	Underground	Inactive	8	256.24	0.649%	1.16	1.687%	0.05	0.13	1.93	4.32	13,295.00	1.00	25,701.25	764,400.00	5,766.86	19,934.39
2001	Underground	Inactive	2	6.00	0.674%	1.25	1.698%	0.01	0.03	0.05	0.10	13,295.00	1.00	671.91	91,081.00	767.19	-
2002	Underground	Inactive	1	47.21	0.698%	0.90	1.705%	0.01	0.02	0.30	0.80	13,295.00	1.00	3,940.69	1,004,239.64	6,305.04	-
2003	Underground	Inactive	5	212.02	0.720%	0.76	1.706%	0.04	0.09	1.16	3.62	13,295.00	1.00	15,426.73	1,542,844.00	8,443.66	6,983.07
2004	Underground	Inactive	3	180.23	0.741%	0.55	1.702%	0.02	0.05	0.73	3.07	13,295.00	1.00	9,768.60	787,000.00	3,208.42	6,560.18
2005	Underground	Inactive	5	124.90	0.761%	1.11	1.691%	0.04	0.08	1.05	2.11	13,295.00	1.00	14,024.26	365,320.00	3,085.34	10,938.92
2006	Underground	Inactive	6	160.75	0.779%	1.02	1.675%	0.05	0.10	1.27	2.69	13,295.00	1.00	16,923.25	569,719.00	4,511.34	12,411.92
2007	Underground	Inactive	3	107.80	0.795%	0.78	1.653%	0.02	0.05	0.67	1.78	13,295.00	1.00	8,926.78	336,520.00	2,096.04	6,830.75
2008	Underground	Inactive	4	79.05	0.810%	1.25	1.624%	0.03	0.06	0.80	1.28	13,295.00	1.00	10,634.90	221,000.00	2,236.33	8,398.57
2009	Underground	Inactive	7	111.36	0.822%	1.15	1.588%	0.06	0.11	1.05	1.77	13,295.00	1.00	13,994.30	323,520.00	3,057.98	10,936.32
2010	Underground	Inactive	9	161.54	0.832%	1.17	1.545%	0.07	0.14	1.58	2.50	13,295.00	1.00	20,951.49	591,982.00	5,775.04	15,176.45
2011	Underground	Inactive	7	129.26	0.840%	1.15	1.496%	0.06	0.10	1.25	1.93	13,295.00	1.00	16,605.99	437,142.00	4,224.11	12,381.88
2012	Underground	Inactive	1	32.84	0.846%	0.55	1.438%	0.01	0.01	0.15	0.47	13,295.00	1.00	2,031.39	322,898.00	1,502.34	529.05
2013	Underground	Inactive	2	44.71	0.849%	1.25	1.373%	0.02	0.03	0.47	0.61	13,295.00	1.00	6,309.26	130,520.00	1,385.36	4,923.90
2014	Underground	Inactive	1	12.00	0.850%	1.25	1.300%	0.01	0.01	0.13	0.16	13,295.00	1.00	1,694.54	35,040.00	372.17	1,322.36
2015	Underground	Inactive	1	16.83	0.843%	1.25	1.219%	0.01	0.01	0.18	0.21	13,295.00	1.00	2,358.01	31,960.00	336.81	2,021.20
2016	Underground	Inactive	1	13.42	0.831%	1.25	1.130%	0.01	0.01	0.14	0.15	13,295.00	1.00	1,853.57	30,800.00	319.98	1,533.59
2017	Underground	Inactive	-	-	0.803%	0.00	1.032%	-	-	-	-	13,295.00	1.00	-	-	-	-
2018	Underground	Inactive	1	37.86	0.751%	1.25	0.925%	0.01	0.01	0.36	0.35	13,295.00	1.00	4,727.15	61,360.00	576.26	4,150.89
2019	Underground	Inactive	-	-	0.670%	0.00	0.809%	-	-	-	-	13,295.00	1.00	-	-	-	-
2020	Underground	Inactive	-	-	0.552%	0.00	0.683%	-	-	-	-	13,295.00	1.00	-	-	-	-
2021	Underground	Inactive	-	-	0.391%	0.00	0.548%	-	-	-	-	13,295.00	1.00	-	-	-	-
2022	Underground	Inactive	-	-	0.179%	0.00	0.404%	-	-	-	-	13,295.00	1.00	-	-	-	-
2023	Underground	Inactive	-	-	0.000%	0.00	0.249%	-	-	-	-	13,295.00	1.00	-	-	-	-

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model

					2024													
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Underground	Phased Released	-	-	0.268%	0.00	1.608%	-	-	-	-	13,295.00	0.50	-	-	-	-
1966	Underground	Phased Released	-	-	0.275%	0.00	1.675%	-	-	-	-	13,295.00	0.50	-	-	-	-
1967	Underground	Phased Released	-	-	0.282%	0.00	1.745%	-	-	-	-	13,295.00	0.50	-	-	-	-
1968	Underground	Phased Released	-	-	0.289%	0.00	1.818%	-	-	-	-	13,295.00	0.50	-	-	-	-
1969	Underground	Phased Released	-	-	0.297%	0.00	1.894%	-	-	-	-	13,295.00	0.50	-	-	-	-
1970	Underground	Phased Released	-	-	0.304%	0.00	1.973%	-	-	-	-	13,295.00	0.50	-	-	-	-
1971	Underground	Phased Released	-	-	0.312%	0.00	2.055%	-	-	-	-	13,295.00	0.50	-	-	-	-
1972	Underground	Phased Released	-	-	0.320%	0.00	2.140%	-	-	-	-	13,295.00	0.50	-	-	-	-
1973	Underground	Phased Released	-	-	0.328%	0.00	2.230%	-	-	-	-	13,295.00	0.50	-	-	-	-
1974	Underground	Phased Released	-	-	0.337%	0.00	2.323%	-	-	-	-	13,295.00	0.50	-	-	-	-
1975	Underground	Phased Released	-	-	0.345%	0.00	2.419%	-	-	-	-	13,295.00	0.50	-	-	-	-
1976	Underground	Phased Released	-	-	0.354%	0.00	2.520%	-	-	-	-	13,295.00	0.50	-	-	-	-
1977	Underground	Phased Released	-	-	0.363%	0.00	2.625%	-	-	-	-	13,295.00	0.50	-	-	-	-
1978	Underground	Phased Released	3	10.58	0.372%	1.25	2.912%	0.01	0.09	0.05	0.31	13,295.00	0.50	327.43	24,300.00	113.13	214.30
1979	Underground	Phased Released	2	59.68	0.382%	1.25	3.201%	0.01	0.06	0.28	1.91	13,295.00	0.50	1,894.34	101,728.00	485.75	1,408.59
1980	Underground	Phased Released	5	87.19	0.392%	1.25	3.490%	0.02	0.17	0.43	3.04	13,295.00	0.50	2,838.52	50,000.00	244.87	2,593.65
1981	Underground	Phased Released	6	66.33	0.402%	1.13	3.780%	0.02	0.23	0.30	2.51	13,295.00	0.50	2,008.06	192,120.00	874.95	1,133.12
1982	Underground	Phased Released	3	194.36	0.412%	1.25	4.068%	0.01	0.12	1.00	7.91	13,295.00	0.50	6,656.14	80,296.00	413.67	6,242.47
1983	Underground	Phased Released	5	70.38	0.423%	1.25	4.353%	0.02	0.22	0.37	3.06	13,295.00	0.50	2,472.07	64,464.00	340.62	2,131.45
1984	Underground	Phased Released	1	80.60	0.434%	0.55	4.635%	0.00	0.05	0.19	3.74	13,295.00	0.50	1,277.60	130,720.00	311.70	965.89
1985	Underground	Phased Released	3	17.24	0.445%	1.25	4.912%	0.01	0.15	0.10	0.85	13,295.00	0.50	637.00	30,720.00	170.75	466.25
1986	Underground	Phased Released	3	118.96	0.456%	1.25	5.183%	0.01	0.16	0.68	6.17	13,295.00	0.50	4,508.15	119,136.00	679.17	3,828.97
1987	Underground	Phased Released	3	67.09	0.468%	1.25	5.447%	0.01	0.16	0.39	3.65	13,295.00	0.50	2,607.66	77,960.00	455.83	2,151.82
1988	Underground	Phased Released	6	197.49	0.480%	1.25	5.704%	0.03	0.34	1.18	11.26	13,295.00	0.50	7,872.87	215,880.00	1,294.62	6,578.25
1989	Underground	Phased Released	5	80.68	0.492%	1.25	5.951%	0.02	0.30	0.50	4.80	13,295.00	0.50	3,298.75	54,320.00	334.11	2,964.64
1990	Underground	Phased Released	2	18.31	0.505%	1.25	6.188%	0.01	0.12	0.12	1.13	13,295.00	0.50	767.83	20,000.00	126.17	641.66
1991	Underground	Phased Released	3	23.22	0.518%	1.25	6.414%	0.02	0.19	0.15	1.49	13,295.00	0.50	998.70	30,000.00	194.11	804.60
1992	Underground	Phased Released	2	39.95	0.531%	1.25	6.628%	0.01	0.13	0.27	2.65	13,295.00	0.50	1,762.33	37,960.00	251.91	1,510.42
1993	Underground	Phased Released	4	68.38	0.544%	1.25	6.828%	0.02	0.27	0.47	4.67	13,295.00	0.50	3,093.81	68,453.40	465.91	2,627.90
1994	Underground	Phased Released	2	18.79	0.558%	1.25	7.013%	0.01	0.14	0.13	1.32	13,295.00	0.50	871.94	20,000.00	139.61	732.33
1995	Underground	Phased Released	3	60.54	0.592%	1.25	7.183%	0.02	0.22	0.45	4.35	13,295.00	0.50	2,978.20	63,832.00	472.38	2,505.82
1996	Underground	Phased Released	4	133.37	0.625%	1.25	7.336%	0.03	0.29	1.04	9.78	13,295.00	0.50	6,928.13	93,746.00	732.57	6,195.55
1997	Underground	Phased Released	4	119.99	0.658%	1.25	7.471%	0.03	0.30	0.99	8.96	13,295.00	0.50	6,557.53	105,712.00	869.08	5,688.45
1998	Underground	Phased Released	2	64.00	0.690%	1.25	7.588%	0.01	0.15	0.55	4.86	13,295.00	0.50	3,666.82	65,384.00	563.54	3,103.28
1999	Underground	Phased Released	2	246.00	0.720%	0.90	7.684%	0.01	0.15	1.60	18.90	13,295.00	0.50	10,603.27	253,000.00	1,640.46	8,962.81
2000	Underground	Phased Released	2	59.65	0.750%	1.25	7.759%	0.02	0.16	0.56	4.63	13,295.00	0.50	3,719.26	49,536.19	464.63	3,254.63
2001	Underground	Phased Released	4	36.60	0.779%	1.25	7.812%	0.03	0.31	0.36	2.86	13,295.00	0.50	2,369.54	52,072.00	507.14	1,862.40
2002	Underground	Phased Released	1	48.55	0.807%	1.25	7.842%	0.01	0.08	0.49	3.81	13,295.00	0.50	3,254.00	15,840.00	159.71	3,094.29
2003	Underground	Phased Released	2	31.05	0.833%	1.25	7.847%	0.02	0.16	0.32	2.44	13,295.00	0.50	2,148.21	29,770.00	309.84	1,838.37
2004	Underground	Phased Released	-	-	0.857%	0.00	7.827%	-	-	-	-	13,295.00	0.50	-	-	-	-
2005	Underground	Phased Released	1	21.73	0.880%	1.25	7.780%	0.01	0.08	0.24	1.69	13,295.00	0.50	1,588.50	11,220.00	123.38	1,465.11
2006	Underground	Phased Released	-	-	0.901%	0.00	7.706%	-	-	-	-	13,295.00	0.50	-	-	-	-
2007	Underground	Phased Released	-	-	0.919%	0.00	7.602%	-	-	-	-	13,295.00	0.50	-	-	-	-
2008	Underground	Phased Released	3	63.64	0.936%	1.25	7.469%	0.03	0.22	0.74	4.75	13,295.00	0.50	4,949.75	37,420.00	437.82	4,511.93
2009	Underground	Phased Released	2	54.60	0.950%	1.25	7.305%	0.02	0.15	0.65	3.99	13,295.00	0.50	4,311.70	72,624.00	862.74	3,448.97
2010	Underground	Phased Released	-	-	0.962%	0.00	7.109%	-	-	-	-	13,295.00	0.50	-	-	-	-
2011	Underground	Phased Released	1	25.60	0.972%	1.25	6.880%	0.01	0.07	0.31	1.76	13,295.00	0.50	2,066.69	31,200.00	378.91	1,687.78
2012	Underground	Phased Released	-	-	0.978%	0.00	6.616%	-	-	-	-	13,295.00	0.50	-	-	-	-
2013	Underground	Phased Released	-	-	0.982%	0.00	6.317%	-	-	-	-	13,295.00	0.50	-	-	-	-
2014	Underground	Phased Released	-	-	0.982%	0.00	5.982%	-	-	-	-	13,295.00	0.50	-	-	-	-
2015	Underground	Phased Released	-	-	0.975%	0.00	5.609%	-	-	-	-	13,295.00	0.50	-	-	-	-
2016	Underground	Phased Released	-	-	0.961%	0.00	5.198%	-	-	-	-	13,295.00	0.50	-	-	-	-
2017	Underground	Phased Released	-	-	0.928%	0.00	4.747%	-	-	-	-	13,295.00	0.50	-	-	-	-
2018	Underground	Phased Released	-	-	0.869%	0.00	4.255%	-	-	-	-	13,295.00	0.50	-	-	-	-
2019	Underground	Phased Released	-	-	0.775%	0.00	3.721%	-	-	-	-	13,295.00	0.50	-	-	-	-
2020	Underground	Phased Released	-	-	0.638%	0.00	3.144%	-	-	-	-	13,295.00	0.50	-	-	-	-
2021	Underground	Phased Released	-	-	0.452%	0.00	2.523%	-	-	-	-	13,295.00	0.50	-	-	-	-
2022	Underground	Phased Released	-	-	0.207%	0.00	1.857%	-	-	-	-	13,295.00	0.50	-	-	-	-
2023	Underground	Phased Released	-	-	0.000%	0.00	1.144%	-	-	-	-	13,295.00	0.50	-	-	-	-

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					2024													
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Other	Active	-	-	0.146%	0.00	1.975%	-	-	-	-	9,310.00	1.00	-	-	-	-
1966	Other	Active	-	-	0.150%	0.00	2.015%	-	-	-	-	9,310.00	1.00	-	-	-	-
1967	Other	Active	-	-	0.154%	0.00	2.056%	-	-	-	-	9,310.00	1.00	-	-	-	-
1968	Other	Active	-	-	0.158%	0.00	2.098%	-	-	-	-	9,310.00	1.00	-	-	-	-
1969	Other	Active	-	-	0.162%	0.00	2.141%	-	-	-	-	9,310.00	1.00	-	-	-	-
1970	Other	Active	-	-	0.166%	0.00	2.185%	-	-	-	-	9,310.00	1.00	-	-	-	-
1971	Other	Active	-	-	0.170%	0.00	2.229%	-	-	-	-	9,310.00	1.00	-	-	-	-
1972	Other	Active	1	20.00	0.175%	1.25	2.275%	0.00	0.02	0.04	0.45	9,310.00	1.00	406.94	20,000.00	43.71	363.23
1973	Other	Active	-	-	0.179%	0.00	2.321%	-	-	-	-	9,310.00	1.00	-	-	-	-
1974	Other	Active	1	28.52	0.184%	1.25	2.368%	0.00	0.02	0.07	0.68	9,310.00	1.00	610.44	29,000.00	66.67	543.77
1975	Other	Active	1	6.20	0.189%	1.25	2.417%	0.00	0.02	0.01	0.15	9,310.00	1.00	136.11	10,500.00	24.76	111.35
1976	Other	Active	-	-	0.193%	0.00	2.466%	-	-	-	-	9,310.00	1.00	-	-	-	-
1977	Other	Active	4	223.99	0.198%	1.08	2.516%	0.01	0.10	0.48	5.64	9,310.00	1.00	4,448.41	235,000.00	501.30	3,947.11
1978	Other	Active	-	-	0.204%	0.00	2.568%	-	-	-	-	9,310.00	1.00	-	-	-	-
1979	Other	Active	1	65.00	0.209%	1.25	2.570%	0.00	0.03	0.17	1.67	9,310.00	1.00	1,579.00	65,000.00	169.60	1,409.40
1980	Other	Active	7	364.74	0.214%	1.05	2.541%	0.01	0.18	0.82	9.27	9,310.00	1.00	7,633.55	476,240.00	1,070.58	6,562.97
1981	Other	Active	38	5,211.96	0.220%	0.91	2.483%	0.08	0.94	10.41	129.40	9,310.00	1.00	96,875.68	21,471,990.00	42,868.31	54,007.38
1982	Other	Active	5	586.43	0.225%	0.90	2.400%	0.01	0.12	1.19	14.08	9,310.00	1.00	11,066.32	1,681,960.00	3,409.21	7,657.12
1983	Other	Active	36	3,861.09	0.231%	0.86	2.296%	0.08	0.83	7.68	88.66	9,310.00	1.00	71,500.51	10,423,950.00	20,733.94	50,766.57
1984	Other	Active	31	4,421.79	0.237%	0.76	2.174%	0.07	0.67	8.01	96.14	9,310.00	1.00	74,562.45	12,811,500.00	23,204.51	51,357.94
1985	Other	Active	13	1,543.19	0.243%	1.03	2.038%	0.03	0.26	3.88	31.45	9,310.00	1.00	36,118.45	4,684,180.00	11,775.89	24,342.56
1986	Other	Active	13	1,384.69	0.249%	0.95	1.891%	0.03	0.25	3.29	26.18	9,310.00	1.00	30,644.82	4,968,880.00	11,811.73	18,833.09
1987	Other	Active	7	974.10	0.256%	1.00	1.737%	0.02	0.12	2.49	16.92	9,310.00	1.00	23,180.62	3,831,720.00	9,794.13	13,386.50
1988	Other	Active	9	618.27	0.262%	1.06	1.578%	0.02	0.14	1.71	9.76	9,310.00	1.00	15,928.55	1,712,000.00	4,737.53	11,191.02
1989	Other	Active	7	290.43	0.269%	1.15	1.419%	0.02	0.10	0.90	4.12	9,310.00	1.00	8,360.87	306,000.00	946.20	7,414.68
1990	Other	Active	5	344.46	0.276%	0.97	1.264%	0.01	0.06	0.92	4.35	9,310.00	1.00	8,578.64	422,600.00	1,130.47	7,448.17
1991	Other	Active	6	491.29	0.283%	1.19	1.115%	0.02	0.07	1.66	5.48	9,310.00	1.00	15,416.86	1,374,480.00	4,632.83	10,784.02
1992	Other	Active	10	391.14	0.290%	1.04	0.976%	0.03	0.10	1.18	3.82	9,310.00	1.00	10,986.62	941,160.00	2,839.52	8,147.09
1993	Other	Active	10	946.05	0.298%	0.80	0.850%	0.03	0.09	2.24	8.04	9,310.00	1.00	20,834.12	2,199,520.00	5,202.83	15,631.29
1994	Other	Active	13	2,315.41	0.305%	0.87	0.742%	0.04	0.10	6.17	17.18	9,310.00	1.00	57,434.08	6,683,200.00	17,806.42	39,627.66
1995	Other	Active	6	950.69	0.313%	1.08	0.654%	0.02	0.04	3.20	6.22	9,310.00	1.00	29,780.50	5,426,912.00	18,259.81	11,520.70
1996	Other	Active	3	1,971.02	0.321%	0.78	0.591%	0.01	0.02	4.96	11.64	9,310.00	1.00	46,144.26	9,725,550.00	24,456.32	21,687.94
1997	Other	Active	11	1,403.71	0.329%	0.90	0.555%	0.04	0.06	4.16	7.78	9,310.00	1.00	38,725.35	2,628,640.00	7,789.32	30,936.03
1998	Other	Active	5	1,144.42	0.338%	1.04	0.549%	0.02	0.03	4.02	6.29	9,310.00	1.00	37,418.77	788,520.00	2,769.28	34,649.49
1999	Other	Active	5	404.95	0.346%	0.97	0.579%	0.02	0.03	1.36	2.34	9,310.00	1.00	12,665.99	960,360.00	3,226.43	9,439.56
2000	Other	Active	1	222.50	0.355%	0.90	0.646%	0.00	0.01	0.71	1.44	9,310.00	1.00	6,622.68	927,680.00	2,965.87	3,656.81
2001	Other	Active	5	381.08	0.364%	0.83	0.756%	0.02	0.04	1.15	2.88	9,310.00	1.00	10,728.80	781,920.00	2,364.55	8,364.26
2002	Other	Active	8	818.79	0.374%	1.16	0.910%	0.03	0.07	3.56	7.45	9,310.00	1.00	33,114.47	2,116,407.00	9,193.79	23,920.68
2003	Other	Active	6	908.39	0.383%	1.13	1.112%	0.02	0.07	3.95	10.10	9,310.00	1.00	36,734.80	4,634,054.00	20,128.75	16,606.05
2004	Other	Active	8	1,149.70	0.455%	0.99	1.367%	0.04	0.11	5.16	15.71	9,310.00	1.00	48,067.20	3,776,432.00	16,958.84	31,108.35
2005	Other	Active	2	23.99	0.535%	0.90	1.677%	0.01	0.03	0.12	0.40	9,310.00	1.00	1,075.91	188,600.00	908.53	167.38
2006	Other	Active	7	491.96	0.625%	1.00	2.046%	0.04	0.14	3.08	10.07	9,310.00	1.00	28,635.31	1,329,340.00	8,311.10	20,324.21
2007	Other	Active	6	394.47	0.725%	1.08	2.478%	0.04	0.15	3.07	9.77	9,310.00	1.00	28,626.14	1,111,040.00	8,660.22	19,965.92
2008	Other	Active	7	599.63	0.835%	1.10	2.975%	0.06	0.21	5.51	17.84	9,310.00	1.00	51,297.82	1,605,520.00	14,753.04	36,544.77
2009	Other	Active	4	174.78	0.956%	1.08	3.542%	0.04	0.14	1.80	6.19	9,310.00	1.00	16,731.15	180,000.00	1,850.79	14,880.36
2010	Other	Active	9	1,066.83	1.084%	0.98	4.182%	0.10	0.38	11.31	44.62	9,310.00	1.00	105,294.69	4,421,620.00	46,875.19	58,419.51
2011	Other	Active	4	365.79	1.207%	0.90	4.899%	0.05	0.20	3.97	17.92	9,310.00	1.00	36,981.00	443,560.00	4,816.70	32,164.30
2012	Other	Active	8	213.57	1.304%	1.16	5.695%	0.10	0.46	3.24	12.16	9,310.00	1.00	30,139.30	372,980.00	5,653.65	24,485.65
2013	Other	Active	18	2,100.30	1.358%	1.00	6.575%	0.24	1.18	28.45	138.10	9,310.00	1.00	264,824.74	3,781,480.00	51,214.08	213,610.66
2014	Other	Active	8	282.83	1.351%	1.21	7.542%	0.11	0.60	4.61	21.33	9,310.00	1.00	42,911.37	662,720.00	10,800.09	32,111.28
2015	Other	Active	9	1,105.29	1.264%	1.13	8.768%	0.11	0.79	15.84	96.91	9,310.00	1.00	147,467.24	2,851,300.00	40,861.33	106,605.90
2016	Other	Active	6	1,513.50	1.100%	1.13	11.452%	0.07	0.69	18.88	173.33	9,310.00	1.00	175,732.22	292,180.00	3,643.93	172,088.29
2017	Other	Active	6	385.95	0.861%	1.13	16.294%	0.05	0.98	3.77	62.89	9,310.00	1.00	35,064.67	252,280.00	2,461.91	32,602.76
2018	Other	Active	2	21.89	0.596%	1.25	22.013%	0.01	0.44	0.16	4.82	9,310.00	1.00	1,518.23	18,500.00	137.82	1,380.41
2019	Other	Active	5	6.47	0.341%	1.25	26.670%	0.02	1.33	0.03	1.73	9,310.00	1.00	256.66	4,000.00	17.05	239.61
2020	Other	Active	6	563.58	0.187%	1.13	28.373%	0.01	1.70	1.19	159.90	9,310.00	1.00	11,116.95	161,140.00	341.42	10,775.54
2021	Other	Active	16	122.97	0.033%	1.25	25.229%	0.01	4.04	0.05	31.02	9,310.00	1.00	471.34	86,500.00	35.61	435.73
2022	Other	Active	35	605.48	0.000%	1.21	15.346%	-	5.37	-	92.92	9,310.00	1.00	-	486,140.00	-	-
2023	Other	Active	55	863.80	0.000%	1.25	0.000%	-	0.00	-	0.00	9,310.00	1.00	-	238,280.00	-	-

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					2024												
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Other	Inactive	-	-	0.335%	0.00	1.162%	-	-	-	-	9,310.00	1.00	-	$0	-	-
1966	Other	Inactive	-	-	0.343%	0.00	1.185%	-	-	-	-	9,310.00	1.00	-	-	-	-
1967	Other	Inactive	-	-	0.352%	0.00	1.209%	-	-	-	-	9,310.00	1.00	-	-	-	-
1968	Other	Inactive	-	-	0.361%	0.00	1.234%	-	-	-	-	9,310.00	1.00	-	-	-	-
1969	Other	Inactive	-	-	0.370%	0.00	1.259%	-	-	-	-	9,310.00	1.00	-	-	-	-
1970	Other	Inactive	-	-	0.380%	0.00	1.285%	-	-	-	-	9,310.00	1.00	-	-	-	-
1971	Other	Inactive	-	-	0.390%	0.00	1.311%	-	-	-	-	9,310.00	1.00	-	-	-	-
1972	Other	Inactive	-	-	0.400%	0.00	1.338%	-	-	-	-	9,310.00	1.00	-	-	-	-
1973	Other	Inactive	-	-	0.410%	0.00	1.365%	-	-	-	-	9,310.00	1.00	-	-	-	-
1974	Other	Inactive	-	-	0.420%	0.00	1.393%	-	-	-	-	9,310.00	1.00	-	-	-	-
1975	Other	Inactive	-	-	0.431%	0.00	1.422%	-	-	-	-	9,310.00	1.00	-	-	-	-
1976	Other	Inactive	1	14.48	0.442%	1.25	1.451%	0.00	0.01	0.08	0.21	9,310.00	1.00	745.20	15,000.00	82.92	662.28
1977	Other	Inactive	-	-	0.454%	0.00	1.480%	-	-	-	-	9,310.00	1.00	-	-	-	-
1978	Other	Inactive	-	-	0.465%	0.00	1.510%	-	-	-	-	9,310.00	1.00	-	-	-	-
1979	Other	Inactive	1	7.25	0.477%	1.25	1.512%	0.00	0.02	0.04	0.11	9,310.00	1.00	402.56	10,000.00	59.64	342.92
1980	Other	Inactive	1	114.75	0.489%	0.55	1.494%	0.00	0.01	0.31	1.71	9,310.00	1.00	2,875.35	340,400.00	916.17	1,959.18
1981	Other	Inactive	6	707.84	0.502%	0.96	1.460%	0.03	0.09	3.40	10.34	9,310.00	1.00	31,697.35	1,839,840.00	8,849.49	22,847.86
1982	Other	Inactive	2	127.20	0.515%	0.90	1.412%	0.01	0.03	0.59	1.80	9,310.00	1.00	5,486.51	374,000.00	1,732.73	3,753.78
1983	Other	Inactive	7	1,078.40	0.528%	0.95	1.351%	0.04	0.09	5.41	14.57	9,310.00	1.00	50,357.65	6,471,353.00	32,458.69	17,898.96
1984	Other	Inactive	7	440.78	0.542%	0.90	1.279%	0.04	0.09	2.15	5.64	9,310.00	1.00	19,999.62	7,029,082.00	34,256.96	-
1985	Other	Inactive	4	1,198.15	0.555%	0.99	1.199%	0.02	0.05	6.57	14.36	9,310.00	1.00	61,178.81	3,795,300.00	20,815.47	40,363.34
1986	Other	Inactive	-	-	0.570%	0.00	1.112%	-	-	-	-	9,310.00	1.00	-	-	-	-
1987	Other	Inactive	-	-	0.584%	0.00	1.021%	-	-	-	-	9,310.00	1.00	-	-	-	-
1988	Other	Inactive	1	29.83	0.599%	1.25	0.928%	0.01	0.01	0.22	0.28	9,310.00	1.00	2,080.19	30,000.00	224.71	1,855.48
1989	Other	Inactive	4	414.41	0.615%	1.08	0.835%	0.02	0.03	2.74	3.46	9,310.00	1.00	25,490.18	1,188,600.00	7,852.88	17,637.31
1990	Other	Inactive	3	481.66	0.630%	1.13	0.743%	0.02	0.02	3.44	3.58	9,310.00	1.00	32,035.23	1,548,000.00	11,058.82	20,976.42
1991	Other	Inactive	-	-	0.647%	0.00	0.656%	-	-	-	-	9,310.00	1.00	-	-	-	-
1992	Other	Inactive	3	332.18	0.663%	1.13	0.574%	0.02	0.02	2.50	1.91	9,310.00	1.00	23,240.83	1,070,000.00	8,041.04	15,199.79
1993	Other	Inactive	3	163.11	0.680%	1.02	0.500%	0.02	0.02	1.13	0.82	9,310.00	1.00	10,499.65	262,080.00	1,812.09	8,687.57
1994	Other	Inactive	2	395.55	0.698%	1.08	0.437%	0.01	0.01	2.97	1.73	9,310.00	1.00	27,613.47	961,360.00	7,208.68	20,404.79
1995	Other	Inactive	3	641.22	0.715%	1.13	0.385%	0.02	0.01	5.20	2.47	9,310.00	1.00	48,402.89	2,176,080.00	17,643.69	30,759.20
1996	Other	Inactive	1	152.16	0.734%	0.55	0.347%	0.01	0.00	0.61	0.53	9,310.00	1.00	5,716.96	483,560.00	1,951.49	3,765.47
1997	Other	Inactive	1	5.95	0.753%	0.55	0.326%	0.01	0.00	0.02	0.02	9,310.00	1.00	229.29	184,000.00	761.60	-
1998	Other	Inactive	1	117.09	0.772%	0.55	0.323%	0.01	0.00	0.50	0.38	9,310.00	1.00	4,627.81	368,160.00	1,562.94	3,064.87
1999	Other	Inactive	-	-	0.792%	0.00	0.341%	-	-	-	-	9,310.00	1.00	-	-	-	-
2000	Other	Inactive	1	116.73	0.812%	0.55	0.380%	0.01	0.00	0.52	0.44	9,310.00	1.00	4,853.21	117,000.00	522.50	4,330.71
2001	Other	Inactive	1	144.00	0.833%	0.55	0.444%	0.01	0.00	0.66	0.64	9,310.00	1.00	6,140.50	144,000.00	659.56	5,480.94
2002	Other	Inactive	-	-	0.854%	0.00	0.535%	-	-	-	-	9,310.00	1.00	-	-	-	-
2003	Other	Inactive	-	-	0.876%	0.00	0.654%	-	-	-	-	9,310.00	1.00	-	-	-	-
2004	Other	Inactive	1	56.00	1.039%	1.25	0.804%	0.01	0.01	0.73	0.45	9,310.00	1.00	6,774.03	56,000.00	727.61	6,046.42
2005	Other	Inactive	1	50.69	1.223%	1.25	0.986%	0.01	0.01	0.78	0.50	9,310.00	1.00	7,217.04	51,000.00	779.93	6,437.11
2006	Other	Inactive	-	-	1.429%	0.00	1.204%	-	-	-	-	9,310.00	1.00	-	-	-	-
2007	Other	Inactive	-	-	1.657%	0.00	1.457%	-	-	-	-	9,310.00	1.00	-	-	-	-
2008	Other	Inactive	-	-	1.909%	0.00	1.750%	-	-	-	-	9,310.00	1.00	-	-	-	-
2009	Other	Inactive	1	19.80	2.186%	1.25	2.084%	0.02	0.02	0.54	0.41	9,310.00	1.00	5,037.59	20,000.00	546.56	4,491.03
2010	Other	Inactive	-	-	2.478%	0.00	2.460%	-	-	-	-	9,310.00	1.00	-	-	-	-
2011	Other	Inactive	-	-	2.758%	0.00	2.882%	-	-	-	-	9,310.00	1.00	-	-	-	-
2012	Other	Inactive	-	-	2.980%	0.00	3.350%	-	-	-	-	9,310.00	1.00	-	-	-	-
2013	Other	Inactive	-	-	3.104%	0.00	3.868%	-	-	-	-	9,310.00	1.00	-	-	-	-
2014	Other	Inactive	-	-	3.088%	0.00	4.437%	-	-	-	-	9,310.00	1.00	-	-	-	-
2015	Other	Inactive	-	-	2.890%	0.00	5.158%	-	-	-	-	9,310.00	1.00	-	-	-	-
2016	Other	Inactive	-	-	2.515%	0.00	6.737%	-	-	-	-	9,310.00	1.00	-	-	-	-
2017	Other	Inactive	-	-	1.968%	0.00	9.585%	-	-	-	-	9,310.00	1.00	-	-	-	-
2018	Other	Inactive	1	11.88	1.362%	1.25	12.949%	0.01	0.13	0.20	1.54	9,310.00	1.00	1,883.34	12,000.00	204.34	1,679.01
2019	Other	Inactive	-	-	0.779%	0.00	15.689%	-	-	-	-	9,310.00	1.00	-	-	-	-
2020	Other	Inactive	-	-	0.427%	0.00	16.690%	-	-	-	-	9,310.00	1.00	-	-	-	-
2021	Other	Inactive	-	-	0.075%	0.00	14.841%	-	-	-	-	9,310.00	1.00	-	-	-	-
2022	Other	Inactive	-	-	0.000%	0.00	9.027%	-	-	-	-	9,310.00	1.00	-	-	-	-
2023	Other	Inactive	-	-	0.000%	0.00	0.000%	-	-	-	-	9,310.00	1.00	-	-	-	-

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					2024													
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Forfeiture Rate (6)	Adjustment Factor Permit Bond Size (7)	Release Rate (8)	Forfeited Permit Count (9)	Released Permit Count (10)	Forfeited Acres (11)	Released Acres (12)	Avg Recl Cost per Acre (13)	Adjustment Factor Permit Status (14)	Gross Cost (15)	Current Security Amount (16)	Forfeited Security Amount (17)	Net Cost (18)
1965	Other	Phased Released	-	-	0.387%	0.00	5.343%	-	-	-	-	9,310.00	0.50	-	-	-	-
1966	Other	Phased Released	-	-	0.397%	0.00	5.452%	-	-	-	-	9,310.00	0.50	-	-	-	-
1967	Other	Phased Released	-	-	0.407%	0.00	5.563%	-	-	-	-	9,310.00	0.50	-	-	-	-
1968	Other	Phased Released	-	-	0.418%	0.00	5.677%	-	-	-	-	9,310.00	0.50	-	-	-	-
1969	Other	Phased Released	-	-	0.428%	0.00	5.793%	-	-	-	-	9,310.00	0.50	-	-	-	-
1970	Other	Phased Released	-	-	0.439%	0.00	5.911%	-	-	-	-	9,310.00	0.50	-	-	-	-
1971	Other	Phased Released	-	-	0.451%	0.00	6.032%	-	-	-	-	9,310.00	0.50	-	-	-	-
1972	Other	Phased Released	-	-	0.462%	0.00	6.155%	-	-	-	-	9,310.00	0.50	-	-	-	-
1973	Other	Phased Released	1	9.00	0.474%	1.25	6.280%	0.00	0.06	0.05	0.57	9,310.00	0.50	248.19	10,000.00	59.24	188.95
1974	Other	Phased Released	-	-	0.486%	0.00	6.409%	-	-	-	-	9,310.00	0.50	-	-	-	-
1975	Other	Phased Released	-	-	0.499%	0.00	6.539%	-	-	-	-	9,310.00	0.50	-	-	-	-
1976	Other	Phased Released	2	27.88	0.511%	1.25	6.673%	0.01	0.13	0.18	1.86	9,310.00	0.50	829.50	10,000.00	63.92	765.59
1977	Other	Phased Released	-	-	0.524%	0.00	6.809%	-	-	-	-	9,310.00	0.50	-	-	-	-
1978	Other	Phased Released	1	12.76	0.538%	1.25	6.948%	0.01	0.07	0.09	0.89	9,310.00	0.50	399.36	10,000.00	67.24	332.13
1979	Other	Phased Released	2	58.69	0.552%	1.25	6.954%	0.01	0.14	0.40	4.08	9,310.00	0.50	1,883.98	20,000.00	137.92	1,746.06
1980	Other	Phased Released	1	7.91	0.566%	1.25	6.875%	0.01	0.07	0.06	0.54	9,310.00	0.50	260.43	10,000.00	70.73	189.70
1981	Other	Phased Released	4	475.54	0.580%	1.08	6.718%	0.02	0.27	2.97	31.95	9,310.00	0.50	13,809.83	204,860.00	1,278.02	12,531.81
1982	Other	Phased Released	2	201.26	0.595%	1.25	6.495%	0.01	0.13	1.50	13.07	9,310.00	0.50	6,970.37	59,200.00	440.45	6,529.92
1983	Other	Phased Released	3	158.90	0.610%	1.02	6.213%	0.02	0.19	0.99	9.87	9,310.00	0.50	4,590.78	188,104.00	1,167.46	3,423.32
1984	Other	Phased Released	4	75.79	0.626%	1.25	5.883%	0.03	0.24	0.59	4.46	9,310.00	0.50	2,761.22	71,000.00	555.68	2,205.54
1985	Other	Phased Released	1	43.00	0.642%	1.25	5.515%	0.01	0.06	0.35	2.37	9,310.00	0.50	1,606.77	17,200.00	138.07	1,468.70
1986	Other	Phased Released	-	-	0.659%	0.00	5.117%	-	-	-	-	9,310.00	0.50	-	-	-	-
1987	Other	Phased Released	-	-	0.676%	0.00	4.699%	-	-	-	-	9,310.00	0.50	-	-	-	-
1988	Other	Phased Released	-	-	0.693%	0.00	4.270%	-	-	-	-	9,310.00	0.50	-	-	-	-
1989	Other	Phased Released	3	62.20	0.711%	1.25	3.841%	0.02	0.12	0.55	2.39	9,310.00	0.50	2,571.91	20,200.00	179.43	2,392.48
1990	Other	Phased Released	-	-	0.729%	0.00	3.420%	-	-	-	-	9,310.00	0.50	-	-	-	-
1991	Other	Phased Released	-	-	0.748%	0.00	3.016%	-	-	-	-	9,310.00	0.50	-	-	-	-
1992	Other	Phased Released	-	-	0.767%	0.00	2.640%	-	-	-	-	9,310.00	0.50	-	-	-	-
1993	Other	Phased Released	-	-	0.786%	0.00	2.301%	-	-	-	-	9,310.00	0.50	-	-	-	-
1994	Other	Phased Released	-	-	0.807%	0.00	2.008%	-	-	-	-	9,310.00	0.50	-	-	-	-
1995	Other	Phased Released	-	-	0.827%	0.00	1.771%	-	-	-	-	9,310.00	0.50	-	-	-	-
1996	Other	Phased Released	-	-	0.848%	0.00	1.598%	-	-	-	-	9,310.00	0.50	-	-	-	-
1997	Other	Phased Released	1	31.16	0.870%	1.25	1.501%	0.01	0.02	0.34	0.47	9,310.00	0.50	1,577.71	14,525.14	157.99	1,419.72
1998	Other	Phased Released	-	-	0.892%	0.00	1.487%	-	-	-	-	9,310.00	0.50	-	-	-	-
1999	Other	Phased Released	1	179.00	0.915%	0.55	1.567%	0.01	0.02	0.90	2.80	9,310.00	0.50	4,194.94	249,600.00	1,256.60	2,938.34
2000	Other	Phased Released	-	-	0.939%	0.00	1.749%	-	-	-	-	9,310.00	0.50	-	-	-	-
2001	Other	Phased Released	-	-	0.963%	0.00	2.044%	-	-	-	-	9,310.00	0.50	-	-	-	-
2002	Other	Phased Released	-	-	0.988%	0.00	2.461%	-	-	-	-	9,310.00	0.50	-	-	-	-
2003	Other	Phased Released	-	-	1.013%	0.00	3.009%	-	-	-	-	9,310.00	0.50	-	-	-	-
2004	Other	Phased Released	-	-	1.202%	0.00	3.698%	-	-	-	-	9,310.00	0.50	-	-	-	-
2005	Other	Phased Released	-	-	1.415%	0.00	4.538%	-	-	-	-	9,310.00	0.50	-	-	-	-
2006	Other	Phased Released	-	-	1.652%	0.00	5.536%	-	-	-	-	9,310.00	0.50	-	-	-	-
2007	Other	Phased Released	-	-	1.916%	0.00	6.704%	-	-	-	-	9,310.00	0.50	-	-	-	-
2008	Other	Phased Released	1	9.90	2.208%	1.25	8.051%	0.02	0.08	0.27	0.80	9,310.00	0.50	1,271.78	10,000.00	275.97	995.81
2009	Other	Phased Released	-	-	2.528%	0.00	9.585%	-	-	-	-	9,310.00	0.50	-	-	-	-
2010	Other	Phased Released	-	-	2.865%	0.00	11.317%	-	-	-	-	9,310.00	0.50	-	-	-	-
2011	Other	Phased Released	-	-	3.189%	0.00	13.256%	-	-	-	-	9,310.00	0.50	-	-	-	-
2012	Other	Phased Released	-	-	3.446%	0.00	15.411%	-	-	-	-	9,310.00	0.50	-	-	-	-
2013	Other	Phased Released	-	-	3.589%	0.00	17.792%	-	-	-	-	9,310.00	0.50	-	-	-	-
2014	Other	Phased Released	-	-	3.571%	0.00	20.408%	-	-	-	-	9,310.00	0.50	-	-	-	-
2015	Other	Phased Released	1	115.00	3.342%	1.25	23.725%	0.03	0.24	4.80	27.28	9,310.00	0.50	22,362.13	16,800.00	701.79	21,660.34
2016	Other	Phased Released	-	-	2.908%	0.00	30.988%	-	-	-	-	9,310.00	0.50	-	-	-	-
2017	Other	Phased Released	-	-	2.276%	0.00	44.089%	-	-	-	-	9,310.00	0.50	-	-	-	-
2018	Other	Phased Released	-	-	1.575%	0.00	59.565%	-	-	-	-	9,310.00	0.50	-	-	-	-
2019	Other	Phased Released	-	-	0.901%	0.00	72.167%	-	-	-	-	9,310.00	0.50	-	-	-	-
2020	Other	Phased Released	-	-	0.494%	0.00	76.774%	-	-	-	-	9,310.00	0.50	-	-	-	-
2021	Other	Phased Released	-	-	0.087%	0.00	68.266%	-	-	-	-	9,310.00	0.50	-	-	-	-
2022	Other	Phased Released	-	-	0.000%	0.00	41.524%	-	-	-	-	9,310.00	0.50	-	-	-	-
2023	Other	Phased Released	-	-	0.000%	0.00	0.000%	-	-	-	-	9,310.00	0.50	-	-	-	-

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					2025																
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Adjusted Permit Coun	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Coun	Released Permit Coun	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Adjustment Current Security Amount	Forfeited Security Amount	Net Cost	Adjusted Permit Coun
(1)	(2)	(3)	(4)	(5)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
1965	Surface	Active	-	-	-	-	0.06%	-	0.82%	-	-	-	-	3,235.00	1	-	-	0	-	-
1966	Surface	Active	-	-	-	-	0.06%	-	0.82%	-	-	-	-	3,235.00	1	-	-	0	-	-
1967	Surface	Active	-	-	-	-	0.06%	-	0.86%	-	-	-	-	3,235.00	1	-	-	0	-	-
1968	Surface	Active	-	-	-	-	0.07%	-	0.89%	-	-	-	-	3,235.00	1	-	-	0	-	-
1969	Surface	Active	-	-	-	-	0.07%	-	0.93%	-	-	-	-	3,235.00	1	-	-	0	-	-
1970	Surface	Active	-	-	-	-	0.07%	-	0.97%	-	-	-	-	3,235.00	1	-	-	0	-	-
1971	Surface	Active	-	-	-	-	0.08%	-	1.01%	-	-	-	-	3,235.00	1	-	-	0	-	-
1972	Surface	Active	1	400.00	0.99	395.20	0.08%	1.25	1.05%	0.00	0.01	0.41	4.14	3,235.00	1	1,312.17	32,215.16	33.06448	1,279.11	0.98
1973	Surface	Active	-	-	-	-	0.09%	-	1.09%	-	-	-	-	3,235.00	1	-	-	0	-	-
1974	Surface	Active	-	-	-	-	0.09%	-	1.14%	-	-	-	-	3,235.00	1	-	-	0	-	-
1975	Surface	Active	-	-	-	-	0.10%	-	1.19%	-	-	-	-	3,235.00	1	-	-	0	-	-
1976	Surface	Active	-	-	-	-	0.10%	-	1.23%	-	-	-	-	3,235.00	1	-	-	0	-	-
1977	Surface	Active	6	1,504.07	5.91	1,482.21	0.11%	1.02	1.29%	0.01	0.08	1.60	19.07	3,235.00	1	5,172.92	4,693,278.22	5063.237	109.68	5.83
1978	Surface	Active	4	2,061.88	3.94	2,030.92	0.11%	0.90	1.34%	0.00	0.05	2.04	27.21	3,235.00	1	6,604.80	4,263,147.95	4285.709	2,319.09	3.88
1979	Surface	Active	2	180.00	1.97	177.18	0.12%	0.90	1.40%	0.00	0.03	0.19	2.47	3,235.00	1	606.55	179,799.50	190.2642	416.28	1.94
1980	Surface	Active	1	475.70	0.98	467.76	0.12%	0.90	1.45%	0.00	0.01	0.52	6.80	3,235.00	1	1,685.55	1,276,861.09	1422.292	263.26	0.97
1981	Surface	Active	8	1,999.30	7.86	1,963.85	0.13%	0.94	1.55%	0.01	0.12	2.41	30.48	3,235.00	1	7,811.21	2,184,169.51	2685.482	5,125.73	7.73
1982	Surface	Active	2	216.78	1.96	212.75	0.14%	0.90	1.64%	0.00	0.03	0.26	3.50	3,235.00	1	849.45	117,766.80	145.3519	704.10	1.93
1983	Surface	Active	2	1,708.57	1.96	1,675.32	0.14%	0.90	1.73%	0.00	0.03	2.18	28.97	3,235.00	1	7,041.21	4,954,175.52	6436.439	604.77	1.92
1984	Surface	Active	-	-	-	-	0.15%	-	1.81%	-	-	-	-	3,235.00	1	-	-	0	-	-
1985	Surface	Active	5	2,501.65	4.89	2,449.66	0.16%	0.76	1.88%	0.01	0.09	2.98	46.12	3,235.00	1	9,633.38	2,101,779.12	2554.967	7,078.41	4.79
1986	Surface	Active	8	2,503.23	7.82	2,448.49	0.17%	0.99	1.95%	0.01	0.15	4.07	47.75	3,235.00	1	13,169.54	4,725,195.72	7856.297	5,313.24	7.66
1987	Surface	Active	3	1,371.12	2.93	1,340.17	0.18%	1.02	2.01%	0.01	0.06	2.41	26.96	3,235.00	1	7,811.80	6,563,407.71	11826.2	-	2.87
1988	Surface	Active	8	1,677.10	7.81	1,638.77	0.19%	0.86	2.07%	0.01	0.16	2.62	33.88	3,235.00	1	8,468.51	1,840,579.90	2940.147	5,528.37	7.64
1989	Surface	Active	7	2,103.52	6.83	2,054.15	0.20%	0.90	2.12%	0.01	0.14	3.63	43.49	3,235.00	1	11,744.60	4,537,299.02	8019.182	3,725.42	6.68
1990	Surface	Active	11	2,621.86	10.73	2,559.43	0.21%	0.84	2.16%	0.02	0.23	4.42	55.31	3,235.00	1	14,314.57	5,114,475.40	8842.25	5,472.32	10.48
1991	Surface	Active	9	2,000.59	8.78	1,951.46	0.22%	0.98	2.20%	0.02	0.19	4.15	42.92	3,235.00	1	13,431.28	7,724,073.77	16433.48	-	8.57
1992	Surface	Active	6	4,639.40	5.85	4,524.55	0.23%	0.90	2.23%	0.01	0.13	9.33	100.98	3,235.00	1	30,172.53	13,772,889.32	28391.41	1,781.12	5.71
1993	Surface	Active	12	4,377.78	11.70	4,267.98	0.24%	0.90	2.26%	0.03	0.26	9.26	96.39	3,235.00	1	29,959.55	9,224,963.05	20017.18	9,942.38	11.40
1994	Surface	Active	7	1,898.65	6.82	1,851.27	0.25%	0.75	2.28%	0.02	0.16	3.52	42.20	3,235.00	1	11,399.28	6,057,414.03	11529.77	-	6.65
1995	Surface	Active	12	7,733.29	11.69	7,534.19	0.27%	0.96	2.30%	0.03	0.27	19.29	172.92	3,235.00	1	62,398.79	17,088,324.36	43748.64	18,650.15	11.39
1996	Surface	Active	12	6,830.47	11.69	6,652.76	0.28%	0.99	2.31%	0.03	0.27	18.47	153.35	3,235.00	1	59,763.76	16,790,091.60	46624.6	13,139.16	11.39
1997	Surface	Active	24	11,904.74	23.37	11,594.38	0.30%	0.96	2.31%	0.07	0.54	32.89	267.77	3,235.00	1	106,399.52	36,571,435.50	103743.3	2,656.25	22.76
1998	Surface	Active	20	11,419.01	19.47	11,123.75	0.31%	0.87	2.31%	0.06	0.45	29.98	256.78	3,235.00	1	96,988.29	42,899,225.57	115622.7	-	18.96
1999	Surface	Active	4	2,008.81	3.89	1,957.17	0.33%	0.81	2.30%	0.01	0.09	5.22	45.05	3,235.00	1	16,872.53	6,760,662.08	18016.35	-	3.79
2000	Surface	Active	6	4,046.61	5.84	3,942.25	0.35%	0.84	2.29%	0.02	0.13	11.46	90.28	3,235.00	1	37,058.63	13,343,332.57	38773.49	-	5.69
2001	Surface	Active	21	7,748.62	20.45	7,546.56	0.36%	0.93	2.27%	0.07	0.46	25.60	171.53	3,235.00	1	82,807.04	29,400,302.26	99723.03	-	19.91
2002	Surface	Active	14	6,126.39	13.63	5,967.72	0.38%	0.93	2.25%	0.05	0.31	21.12	134.31	3,235.00	1	68,313.63	19,718,585.41	69775.15	-	13.27
2003	Surface	Active	19	9,797.63	18.51	9,546.09	0.40%	0.92	2.22%	0.07	0.41	34.79	212.20	3,235.00	1	112,561.57	33,396,970.45	121729.9	-	18.02
2004	Surface	Active	23	12,659.51	22.41	12,337.11	0.41%	0.93	2.19%	0.09	0.49	47.15	270.19	3,235.00	1	152,533.65	30,544,850.70	116739	35,794.62	21.82
2005	Surface	Active	15	4,606.35	14.62	4,488.27	0.42%	1.04	2.15%	0.06	0.31	19.80	96.59	3,235.00	1	64,052.39	11,172,230.18	49285.86	14,766.52	14.24
2006	Surface	Active	11	5,201.55	10.72	5,071.83	0.44%	0.96	2.11%	0.05	0.23	21.36	106.96	3,235.00	1	69,103.66	16,206,464.10	68257.49	846.17	10.45
2007	Surface	Active	23	5,703.65	22.43	5,564.67	0.45%	0.93	2.06%	0.10	0.46	23.27	114.68	3,235.00	1	75,268.93	16,202,694.96	67746.87	7,522.07	21.87
2008	Surface	Active	17	9,829.70	16.59	9,598.21	0.46%	0.86	2.01%	0.08	0.33	38.01	192.70	3,235.00	1	122,953.20	15,421,538.13	61066.49	61,886.71	16.18
2009	Surface	Active	16	6,204.14	15.62	6,060.82	0.47%	0.88	1.95%	0.07	0.30	25.13	118.16	3,235.00	1	81,281.76	16,292,756.04	67543.29	13,738.47	15.24
2010	Surface	Active	11	4,481.21	10.75	4,377.77	0.48%	1.00	1.89%	0.05	0.20	21.02	82.59	3,235.00	1	68,007.57	4,669,596.27	22423.81	45,583.76	10.49
2011	Surface	Active	15	2,487.54	14.66	2,433.48	0.49%	0.85	1.82%	0.07	0.27	10.22	44.26	3,235.00	1	33,047.11	6,903,363.92	28979.56	4,067.56	14.32
2012	Surface	Active	23	8,236.40	22.50	8,060.65	0.50%	0.92	1.75%	0.11	0.39	36.94	140.73	3,235.00	1	119,485.71	15,717,218.32	72019.02	47,466.69	21.99
2013	Surface	Active	22	8,588.04	21.54	8,409.16	0.51%	0.96	1.67%	0.11	0.36	41.21	140.30	3,235.00	1	133,307.74	20,549,393.86	100699.5	32,608.21	21.07
2014	Surface	Active	19	6,755.47	18.62	6,625.08	0.52%	0.83	1.59%	0.10	0.30	28.22	105.08	3,235.00	1	91,290.44	17,930,107.66	76373.51	14,916.93	18.22
2015	Surface	Active	12	3,846.62	11.77	3,774.10	0.52%	0.90	1.50%	0.06	0.18	17.71	56.58	3,235.00	1	57,301.71	9,488,220.10	44531.17	12,770.54	11.53
2016	Surface	Active	9	3,384.53	8.84	3,324.96	0.53%	0.86	1.41%	0.05	0.12	15.04	46.96	3,235.00	1	48,669.34	6,300,731.95	28509.25	20,160.09	8.66
2017	Surface	Active	4	1,137.87	3.93	1,118.08	0.52%	1.08	1.31%	0.02	0.05	6.30	14.63	3,235.00	1	20,372.34	2,686,734.84	15132.73	5,239.61	3.86
2018	Surface	Active	8	3,687.08	7.88	3,630.11	0.51%	1.03	1.19%	0.04	0.09	19.16	43.15	3,235.00	1	61,986.70	9,963,349.64	52590.77	9,395.93	7.74
2019	Surface	Active	8	4,472.27	7.90	4,414.77	0.48%	0.94	1.05%	0.04	0.08	20.18	46.16	3,235.00	1	65,286.75	3,464,819.47	15838.82	49,447.93	7.77
2020	Surface	Active	11	3,978.72	10.89	3,941.48	0.44%	0.74	0.87%	0.05	0.10	12.75	34.43	3,235.00	1	41,260.27	7,784,439.16	25189.88	16,070.38	10.74
2021	Surface	Active	7	3,857.52	6.95	3,832.81	0.36%	0.85	0.67%	0.03	0.05	11.86	25.54	3,235.00	1	38,381.39	5,950,405.83	18419.41	19,961.99	6.88
2022	Surface	Active	15	5,387.71	14.96	5,374.11	0.26%	1.04	0.42%	0.04	0.06	14.64	22.46	3,235.00	1	47,346.51	4,561,421.15	12422.46	34,924.05	14.86
2023	Surface	Active	15	3,969.18	15.00	3,969.18	0.13%	0.99	0.12%	0.02	0.02	4.93	4.86	3,235.00	1	15,946.81	4,152,060.00	5156.588	10,790.22	14.96

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					2025																
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Adjusted Permit Coun	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Coun	Released Permit Coun	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Adjustment Current Security Amount	Forfeited Security Amount	Net Cost	Adjusted Permit Coun
(1)	(2)	(3)	(4)	(5)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
1965	Surface	Inactive	-	-	-	-	0.14%	-	0.48%	-	-	-	-	3,235.00	1	-	-	0	-	-
1966	Surface	Inactive	-	-	-	-	0.14%	-	0.48%	-	-	-	-	3,235.00	1	-	-	0	-	-
1967	Surface	Inactive	-	-	-	-	0.15%	-	0.50%	-	-	-	-	3,235.00	1	-	-	0	-	-
1968	Surface	Inactive	-	-	-	-	0.15%	-	0.52%	-	-	-	-	3,235.00	1	-	-	0	-	-
1969	Surface	Inactive	-	-	-	-	0.16%	-	0.55%	-	-	-	-	3,235.00	1	-	-	0	-	-
1970	Surface	Inactive	-	-	-	-	0.17%	-	0.57%	-	-	-	-	3,235.00	1	-	-	0	-	-
1971	Surface	Inactive	-	-	-	-	0.18%	-	0.59%	-	-	-	-	3,235.00	1	-	-	0	-	-
1972	Surface	Inactive	-	-	-	-	0.19%	-	0.62%	-	-	-	-	3,235.00	1	-	-	0	-	-
1973	Surface	Inactive	-	-	-	-	0.20%	-	0.64%	-	-	-	-	3,235.00	1	-	-	0	-	-
1974	Surface	Inactive	-	-	-	-	0.21%	-	0.67%	-	-	-	-	3,235.00	1	-	-	0	-	-
1975	Surface	Inactive	-	-	-	-	0.22%	-	0.70%	-	-	-	-	3,235.00	1	-	-	0	-	-
1976	Surface	Inactive	1	438.80	0.99	434.89	0.23%	0.55	0.73%	0.00	0.01	0.55	3.16	3,235.00	1	1,782.95	441,410.37	559.4022	1,223.55	0.98
1977	Surface	Inactive	-	-	-	-	0.24%	-	0.76%	-	-	-	-	3,235.00	1	-	-	0	-	-
1978	Surface	Inactive	-	-	-	-	0.26%	-	0.79%	-	-	-	-	3,235.00	1	-	-	0	-	-
1979	Surface	Inactive	-	-	-	-	0.27%	-	0.82%	-	-	-	-	3,235.00	1	-	-	0	-	-
1980	Surface	Inactive	-	-	-	-	0.28%	-	0.86%	-	-	-	-	3,235.00	1	-	-	0	-	-
1981	Surface	Inactive	-	-	-	-	0.30%	-	0.91%	-	-	-	-	3,235.00	1	-	-	0	-	-
1982	Surface	Inactive	-	-	-	-	0.31%	-	0.97%	-	-	-	-	3,235.00	1	-	-	0	-	-
1983	Surface	Inactive	-	-	-	-	0.33%	-	1.02%	-	-	-	-	3,235.00	1	-	-	0	-	-
1984	Surface	Inactive	-	-	-	-	0.35%	-	1.06%	-	-	-	-	3,235.00	1	-	-	0	-	-
1985	Surface	Inactive	-	-	-	-	0.37%	-	1.11%	-	-	-	-	3,235.00	1	-	-	0	-	-
1986	Surface	Inactive	1	411.07	0.98	404.71	0.38%	0.90	1.15%	0.00	0.01	1.40	4.64	3,235.00	1	4,534.61	756,591.47	2620.516	1,914.10	0.97
1987	Surface	Inactive	2	415.61	1.97	408.65	0.41%	1.08	1.18%	0.01	0.02	1.78	4.84	3,235.00	1	5,756.97	987,651.76	4301.021	1,455.95	1.94
1988	Surface	Inactive	1	1,304.38	0.98	1,282.87	0.43%	0.90	1.22%	0.00	0.01	4.92	15.60	3,235.00	1	15,926.99	2,133,824.91	8189.115	7,737.87	0.97
1989	Surface	Inactive	2	176.00	1.97	173.01	0.45%	0.90	1.25%	0.01	0.02	0.70	2.15	3,235.00	1	2,261.05	350,503.17	1415.946	845.11	1.93
1990	Surface	Inactive	1	70.12	0.98	69.02	0.47%	0.55	1.27%	0.00	0.01	0.18	0.88	3,235.00	1	580.24	239,582.84	622.5968	-	0.96
1991	Surface	Inactive	-	-	-	-	0.50%	-	1.29%	-	-	-	-	3,235.00	1	-	-	0	-	-
1992	Surface	Inactive	-	-	-	-	0.52%	-	1.31%	-	-	-	-	3,235.00	1	-	-	0	-	-
1993	Surface	Inactive	-	-	-	-	0.55%	-	1.33%	-	-	-	-	3,235.00	1	-	-	0	-	-
1994	Surface	Inactive	-	-	-	-	0.58%	-	1.34%	-	-	-	-	3,235.00	1	-	-	0	-	-
1995	Surface	Inactive	2	2,098.71	1.96	2,058.11	0.61%	0.90	1.35%	0.01	0.03	11.31	27.79	3,235.00	1	36,589.50	5,350,985.44	29406.73	7,182.77	1.92
1996	Surface	Inactive	-	-	-	-	0.64%	-	1.36%	-	-	-	-	3,235.00	1	-	-	0	-	-
1997	Surface	Inactive	-	-	-	-	0.68%	-	1.36%	-	-	-	-	3,235.00	1	-	-	0	-	-
1998	Surface	Inactive	1	846.89	0.98	829.71	0.71%	0.90	1.36%	0.01	0.01	5.32	11.27	3,235.00	1	17,204.49	4,013,973.26	25728.63	-	0.96
1999	Surface	Inactive	1	1,733.11	0.98	1,692.67	0.75%	1.25	1.35%	0.01	0.01	15.86	22.92	3,235.00	1	51,313.51	24,753.39	231.9641	51,081.55	0.96
2000	Surface	Inactive	-	-	-	-	0.79%	-	1.35%	-	-	-	-	3,235.00	1	-	-	0	-	-
2001	Surface	Inactive	-	-	-	-	0.83%	-	1.34%	-	-	-	-	3,235.00	1	-	-	0	-	-
2002	Surface	Inactive	3	1,146.85	2.93	1,123.70	0.87%	0.78	1.32%	0.03	0.04	7.70	14.88	3,235.00	1	24,898.79	6,121,946.95	41931.6	-	2.87
2003	Surface	Inactive	1	1,161.50	0.98	1,136.72	0.91%	0.90	1.31%	0.01	0.01	9.28	14.86	3,235.00	1	30,022.12	5,007,704.30	40883.82	-	0.96
2004	Surface	Inactive	3	3,700.97	2.93	3,621.82	0.94%	0.90	1.29%	0.03	0.04	30.60	46.66	3,235.00	1	99,005.25	16,120,772.37	136220.5	-	2.87
2005	Surface	Inactive	-	-	-	-	0.97%	-	1.27%	-	-	-	-	3,235.00	1	-	-	0	-	-
2006	Surface	Inactive	1	244.59	0.98	240.24	1.00%	0.55	1.24%	0.01	0.01	1.32	2.98	3,235.00	1	4,270.30	292,738.81	1608.473	2,661.83	0.96
2007	Surface	Inactive	1	1,080.24	0.98	1,061.22	1.03%	0.55	1.21%	0.01	0.01	6.00	12.86	3,235.00	1	19,394.60	227,672.63	1286.209	18,108.39	0.96
2008	Surface	Inactive	1	118.60	0.98	115.64	1.05%	1.25	1.18%	0.01	0.01	1.52	1.37	3,235.00	1	4,928.18	89,800.85	1182.997	3,745.18	0.96
2009	Surface	Inactive	3	680.43	2.93	668.75	1.08%	0.55	1.15%	0.03	0.03	3.97	7.67	3,235.00	1	12,839.73	1,065,582.37	6324.162	6,515.57	2.87
2010	Surface	Inactive	2	1,146.11	1.96	1,120.00	1.10%	1.08	1.11%	0.02	0.02	13.28	12.43	3,235.00	1	42,946.68	3,710,638.22	43983.29	-	1.91
2011	Surface	Inactive	3	1,088.67	2.93	1,067.73	1.12%	0.78	1.07%	0.03	0.03	9.40	11.42	3,235.00	1	30,424.02	3,580,096.69	31533.74	-	2.87
2012	Surface	Inactive	-	-	-	-	1.14%	-	1.03%	-	-	-	-	3,235.00	1	-	-	0	-	-
2013	Surface	Inactive	1	93.44	0.98	91.96	1.16%	0.55	0.98%	0.01	0.01	0.59	0.90	3,235.00	1	1,901.89	261,494.37	1671.715	230.18	0.96
2014	Surface	Inactive	2	415.42	1.96	407.30	1.18%	0.90	0.93%	0.02	0.02	4.32	3.80	3,235.00	1	13,972.27	351,152.14	3723.691	10,248.58	1.92
2015	Surface	Inactive	3	1,156.30	2.94	1,137.44	1.19%	0.67	0.88%	0.04	0.03	9.04	10.03	3,235.00	1	29,239.41	943,623.48	7498.359	21,741.05	2.88
2016	Surface	Inactive	2	776.75	1.96	764.03	1.20%	0.73	0.83%	0.02	0.02	6.65	6.35	3,235.00	1	21,521.75	2,695,828.51	23474.03	-	1.92
2017	Surface	Inactive	1	154.63	0.98	151.92	1.20%	0.90	0.77%	0.01	0.01	1.64	1.17	3,235.00	1	5,297.12	623,366.46	6718.803	-	0.96
2018	Surface	Inactive	1	351.08	0.98	345.42	1.17%	0.90	0.70%	0.01	0.01	3.64	2.42	3,235.00	1	11,766.02	563,726.29	5935.713	5,830.30	0.96
2019	Surface	Inactive	1	452.10	0.98	445.72	1.11%	0.90	0.62%	0.01	0.01	4.44	2.74	3,235.00	1	14,367.51	505,417.86	5036.17	9,331.34	0.97
2020	Surface	Inactive	-	-	-	-	1.00%	-	0.51%	-	-	-	-	3,235.00	1	-	-	0	-	-
2021	Surface	Inactive	-	-	-	-	0.83%	-	0.39%	-	-	-	-	3,235.00	1	-	-	0	-	-
2022	Surface	Inactive	-	-	-	-	0.60%	-	0.25%	-	-	-	-	3,235.00	1	-	-	0	-	-
2023	Surface	Inactive	-	-	-	-	0.29%	-	0.07%	-	-	-	-	3,235.00	1	-	-	0	-	-

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					2025																
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Adjusted Permit Coun (19)	Adjusted Acres (20)	Forfeiture Rate (21)	Adjustment Factor Permit Bond Size (22)	Release Rate (23)	Forfeited Permit Coun (24)	Released Permit Coun (25)	Forfeited Acres (26)	Released Acres (27)	Avg recl Cost per Acre (28)	Adjustment Factor Permit Status (29)	Gross Cost (30)	Adjustment Current Security Amount (31)	Forfeited Security Amount (32)	Net Cost (33)	Adjusted Permit Coun (34)
1965	Surface	Phased Released	-	-	-	-	0.16%	-	2.22%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1966	Surface	Phased Released	-	-	-	-	0.16%	-	2.22%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1967	Surface	Phased Released	-	-	-	-	0.17%	-	2.31%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1968	Surface	Phased Released	-	-	-	-	0.18%	-	2.41%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1969	Surface	Phased Released	-	-	-	-	0.19%	-	2.51%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1970	Surface	Phased Released	-	-	-	-	0.20%	-	2.62%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1971	Surface	Phased Released	-	-	-	-	0.21%	-	2.72%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1972	Surface	Phased Released	-	-	-	-	0.22%	-	2.84%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1973	Surface	Phased Released	-	-	-	-	0.23%	-	2.96%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1974	Surface	Phased Released	2	189.60	1.93	182.92	0.24%	1.25	3.08%	0.00	0.06	0.55	5.63	3,235.00	0.5	889.26	97,939.16	294.3637	594.90	1.87
1975	Surface	Phased Released	2	7.80	1.93	7.51	0.25%	1.25	3.21%	0.00	0.06	0.02	0.24	3,235.00	0.5	38.45	30,498.09	96.48882	-	1.86
1976	Surface	Phased Released	5	626.17	4.81	602.18	0.27%	1.25	3.34%	0.01	0.16	2.01	20.12	3,235.00	0.5	3,243.79	111,856.50	372.5134	2,871.27	4.64
1977	Surface	Phased Released	2	48.00	1.92	46.08	0.28%	1.25	3.48%	0.01	0.07	0.16	1.60	3,235.00	0.5	261.30	14,695.57	51.51617	209.78	1.85
1978	Surface	Phased Released	2	158.81	1.92	152.20	0.30%	1.25	3.63%	0.01	0.07	0.56	5.52	3,235.00	0.5	908.41	49,805.79	183.7864	724.62	1.84
1979	Surface	Phased Released	2	358.00	1.91	342.45	0.31%	1.25	3.78%	0.01	0.07	1.33	12.93	3,235.00	0.5	2,151.57	121,899.54	473.4913	1,678.08	1.84
1980	Surface	Phased Released	1	253.42	0.95	241.69	0.33%	1.25	3.93%	0.00	0.04	0.99	9.51	3,235.00	0.5	1,598.40	64,471.32	263.6045	1,334.79	0.91
1981	Surface	Phased Released	7	1,785.41	6.66	1,699.53	0.34%	1.00	4.20%	0.02	0.28	5.85	71.37	3,235.00	0.5	9,465.10	1,565,824.28	5391.327	4,073.77	6.36
1982	Surface	Phased Released	-	-	-	-	0.36%	-	4.45%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1983	Surface	Phased Released	5	302.61	4.74	286.28	0.38%	1.25	4.68%	0.02	0.22	1.37	13.40	3,235.00	0.5	2,208.24	168,949.99	805.7005	1,402.54	4.50
1984	Surface	Phased Released	4	2,585.75	3.78	2,442.28	0.40%	1.08	4.90%	0.02	0.19	10.54	119.55	3,235.00	0.5	17,054.12	2,231,572.78	9633.883	7,420.24	3.58
1985	Surface	Phased Released	2	1,270.29	1.89	1,198.17	0.42%	0.90	5.09%	0.01	0.10	4.56	61.04	3,235.00	0.5	7,373.33	348,269.65	1325.002	6,048.32	1.78
1986	Surface	Phased Released	4	1,041.15	3.76	980.08	0.44%	0.90	5.28%	0.02	0.20	3.93	51.72	3,235.00	0.5	6,348.70	542,989.31	2174.545	4,174.16	3.55
1987	Surface	Phased Released	4	760.81	3.76	714.87	0.47%	0.90	5.44%	0.02	0.20	3.01	38.91	3,235.00	0.5	4,874.46	440,671.84	1857.671	3,016.79	3.53
1988	Surface	Phased Released	5	478.00	4.69	447.51	0.49%	1.25	5.59%	0.02	0.26	2.76	25.03	3,235.00	0.5	4,461.17	110,279.89	679.6633	3,781.51	4.40
1989	Surface	Phased Released	5	1,098.64	4.68	1,027.73	0.52%	1.11	5.73%	0.02	0.27	5.92	58.88	3,235.00	0.5	9,576.58	253,006.39	1457.533	8,119.05	4.39
1990	Surface	Phased Released	4	764.18	3.74	713.21	0.55%	1.25	5.85%	0.02	0.22	4.87	41.71	3,235.00	0.5	7,877.92	210,849.38	1439.868	6,438.05	3.50
1991	Surface	Phased Released	5	1,006.45	4.67	939.76	0.58%	0.97	5.95%	0.03	0.28	5.24	55.93	3,235.00	0.5	8,479.11	533,994.02	2978.686	5,500.43	4.36
1992	Surface	Phased Released	-	-	-	-	0.61%	-	6.04%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
1993	Surface	Phased Released	1	562.59	0.93	523.17	0.64%	1.25	6.11%	0.01	0.06	4.17	31.97	3,235.00	0.5	6,740.11	37,036.85	294.9942	6,445.12	0.87
1994	Surface	Phased Released	5	386.03	4.65	359.60	0.67%	0.90	6.17%	0.03	0.29	2.17	22.18	3,235.00	0.5	3,511.21	1,129,261.50	6816.836	-	4.34
1995	Surface	Phased Released	3	484.30	2.79	450.01	0.71%	1.13	6.21%	0.02	0.17	3.60	27.95	3,235.00	0.5	5,824.39	558,353.16	4467.75	1,356.64	2.60
1996	Surface	Phased Released	4	675.12	3.72	628.18	0.74%	0.90	6.24%	0.03	0.23	4.20	39.18	3,235.00	0.5	6,796.22	722,164.38	4830.334	1,965.89	3.46
1997	Surface	Phased Released	2	969.50	1.86	900.36	0.78%	1.08	6.25%	0.01	0.12	7.57	56.26	3,235.00	0.5	12,247.39	1,554,119.47	13069.77	-	1.73
1998	Surface	Phased Released	3	511.73	2.79	476.38	0.82%	0.78	6.25%	0.02	0.17	3.07	29.76	3,235.00	0.5	4,970.45	577,110.59	3722.691	1,247.76	2.59
1999	Surface	Phased Released	1	14.87	0.93	13.78	0.87%	1.25	6.23%	0.01	0.06	0.15	0.86	3,235.00	0.5	241.49	10,518.65	113.9719	127.52	0.86
2000	Surface	Phased Released	1	19.70	0.93	18.25	0.91%	1.25	6.20%	0.01	0.06	0.21	1.13	3,235.00	0.5	336.72	-	0	336.72	0.86
2001	Surface	Phased Released	3	491.55	2.79	456.56	0.96%	1.02	6.15%	0.03	0.17	4.46	28.08	3,235.00	0.5	7,211.14	488,174.18	4766.877	2,444.27	2.59
2002	Surface	Phased Released	2	154.49	1.86	143.17	1.01%	1.25	6.09%	0.02	0.11	1.81	8.72	3,235.00	0.5	2,926.64	140,933.69	1781.073	1,145.57	1.73
2003	Surface	Phased Released	1	-	0.93	-	1.05%	1.25	6.01%	0.01	0.06	-	-	3,235.00	0.5	-	-	0	-	0.86
2004	Surface	Phased Released	2	470.13	1.86	437.09	1.09%	1.08	5.93%	0.02	0.11	5.10	25.90	3,235.00	0.5	8,250.63	588,817.47	6871.554	1,379.07	1.73
2005	Surface	Phased Released	1	51.50	0.93	47.82	1.12%	1.25	5.82%	0.01	0.05	0.67	2.78	3,235.00	0.5	1,083.84	38,949.38	545.7998	538.04	0.87
2006	Surface	Phased Released	1	60.78	0.93	56.49	1.16%	1.25	5.71%	0.01	0.05	0.82	3.22	3,235.00	0.5	1,319.28	48,469.59	699.8451	619.43	0.87
2007	Surface	Phased Released	1	186.68	0.93	175.29	1.19%	0.55	5.58%	0.01	0.05	1.14	9.77	3,235.00	0.5	1,852.03	140,889.38	920.3026	931.73	0.87
2008	Surface	Phased Released	-	-	-	-	1.22%	-	5.43%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2009	Surface	Phased Released	2	220.84	1.87	207.03	1.25%	0.90	5.28%	0.02	0.10	2.32	10.92	3,235.00	0.5	3,760.37	225,716.01	2534.603	1,225.77	1.75
2010	Surface	Phased Released	-	-	-	-	1.27%	-	5.10%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2011	Surface	Phased Released	2	214.01	1.88	200.36	1.30%	1.25	4.92%	0.02	0.09	3.26	9.86	3,235.00	0.5	5,266.86	113,703.73	1847.867	3,418.99	1.76
2012	Surface	Phased Released	-	-	-	-	1.32%	-	4.72%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2013	Surface	Phased Released	-	-	-	-	1.34%	-	4.51%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2014	Surface	Phased Released	1	27.91	0.95	26.30	1.36%	1.25	4.29%	0.01	0.04	0.45	1.13	3,235.00	0.5	724.35	20,441.67	348.1079	376.24	0.89
2015	Surface	Phased Released	-	-	-	-	1.38%	-	4.06%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2016	Surface	Phased Released	-	-	-	-	1.39%	-	3.82%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2017	Surface	Phased Released	-	-	-	-	1.38%	-	3.54%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2018	Surface	Phased Released	-	-	-	-	1.35%	-	3.22%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2019	Surface	Phased Released	-	-	-	-	1.28%	-	2.83%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2020	Surface	Phased Released	-	-	-	-	1.15%	-	2.36%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2021	Surface	Phased Released	-	-	-	-	0.96%	-	1.80%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2022	Surface	Phased Released	-	-	-	-	0.69%	-	1.13%	-	-	-	-	3,235.00	0.5	-	-	0	-	-
2023	Surface	Phased Released	-	-	-	-	0.33%	-	0.33%	-	-	-	-	3,235.00	0.5	-	-	0	-	-

West Virginia Department of Environmental Protection Office of Special Reclam
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model

					2025															
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Adjusted Permit Coun (19)	Adjusted Acres (20)	Forfeiture Rate (21)	Adjustment Factor Permit Bond Size (22)	Release Rate (23)	Forfeited Permit Coun (24)	Released Permit Coun (25)	Forfeited Acres (26)	Released Acres (27)	Avg recl Cost per Acre (28)	Adjustment Factor Permit Status (29)	Gross Cost (30)	Adjustment Current Security Amount (31)	Forfeited Security Amount (32)	Net Cost (33)	Adjusted Permit Coun (34)
1965	Underground	Active	-	-	-	-	0.10%	-	0.59%	-	-	-	-	13,295.00	1	-	-	0	-	-
1966	Underground	Active	-	-	-	-	0.10%	-	0.59%	-	-	-	-	13,295.00	1	-	-	0	-	-
1967	Underground	Active	-	-	-	-	0.10%	-	0.62%	-	-	-	-	13,295.00	1	-	-	0	-	-
1968	Underground	Active	-	-	-	-	0.11%	-	0.64%	-	-	-	-	13,295.00	1	-	-	0	-	-
1969	Underground	Active	-	-	-	-	0.11%	-	0.67%	-	-	-	-	13,295.00	1	-	-	0	-	-
1970	Underground	Active	-	-	-	-	0.11%	-	0.70%	-	-	-	-	13,295.00	1	-	-	0	-	-
1971	Underground	Active	-	-	-	-	0.12%	-	0.73%	-	-	-	-	13,295.00	1	-	-	0	-	-
1972	Underground	Active	-	-	-	-	0.12%	-	0.76%	-	-	-	-	13,295.00	1	-	-	0	-	-
1973	Underground	Active	-	-	-	-	0.12%	-	0.79%	-	-	-	-	13,295.00	1	-	-	0	-	-
1974	Underground	Active	-	-	-	-	0.12%	-	0.82%	-	-	-	-	13,295.00	1	-	-	0	-	-
1975	Underground	Active	-	-	-	-	0.13%	-	0.86%	-	-	-	-	13,295.00	1	-	-	0	-	-
1976	Underground	Active	-	-	-	-	0.13%	-	0.89%	-	-	-	-	13,295.00	1	-	-	0	-	-
1977	Underground	Active	-	-	-	-	0.13%	-	0.93%	-	-	-	-	13,295.00	1	-	-	0	-	-
1978	Underground	Active	-	-	-	-	0.14%	-	0.97%	-	-	-	-	13,295.00	1	-	-	0	-	-
1979	Underground	Active	8	755.59	7.89	745.53	0.14%	1.03	1.08%	0.01	0.08	1.08	8.02	13,295.00	1	14,404.78	4,962,104.61	7211.436	7,193.35	7.80
1980	Underground	Active	5	222.16	4.93	218.97	0.14%	0.97	1.18%	0.01	0.06	0.31	2.59	13,295.00	1	4,081.70	475,954.60	667.3052	3,414.40	4.86
1981	Underground	Active	17	720.89	16.74	709.54	0.15%	1.17	1.29%	0.02	0.22	1.23	9.15	13,295.00	1	16,329.00	4,007,512.52	6936.958	9,392.04	16.50
1982	Underground	Active	3	80.68	2.95	79.34	0.15%	1.02	1.40%	0.00	0.04	0.12	1.11	13,295.00	1	1,630.55	255,114.89	394.3596	1,236.19	2.90
1983	Underground	Active	29	7,126.06	28.49	7,001.03	0.16%	0.91	1.50%	0.04	0.43	9.96	105.24	13,295.00	1	132,388.77	31,634,088.13	44994.18	87,394.59	28.01
1984	Underground	Active	17	2,930.46	16.68	2,875.35	0.16%	1.02	1.61%	0.03	0.27	4.71	46.26	13,295.00	1	62,581.72	13,430,631.33	21986.98	40,594.74	16.39
1985	Underground	Active	3	49.00	2.94	48.01	0.16%	1.25	1.71%	0.00	0.05	0.10	0.82	13,295.00	1	1,308.79	137,989.18	282.9562	1,025.84	2.89
1986	Underground	Active	5	252.11	4.90	246.80	0.17%	1.11	1.82%	0.01	0.09	0.46	4.48	13,295.00	1	6,127.91	405,461.85	757.2382	5,370.67	4.80
1987	Underground	Active	5	203.45	4.89	198.95	0.17%	1.11	1.92%	0.01	0.09	0.38	3.81	13,295.00	1	5,066.64	399,373.85	764.9931	4,301.65	4.79
1988	Underground	Active	5	179.01	4.89	174.88	0.18%	1.11	2.01%	0.01	0.10	0.34	3.52	13,295.00	1	4,567.64	504,044.32	990.2435	3,577.39	4.78
1989	Underground	Active	9	124.25	8.79	121.23	0.18%	1.25	2.11%	0.02	0.19	0.28	2.56	13,295.00	1	3,657.19	263,693.88	598.3506	3,058.84	8.58
1990	Underground	Active	4	131.40	3.90	128.13	0.19%	1.08	2.20%	0.01	0.09	0.26	2.82	13,295.00	1	3,409.36	304,613.41	609.6752	2,799.68	3.81
1991	Underground	Active	3	35.30	2.92	34.38	0.19%	1.25	2.29%	0.01	0.07	0.08	0.79	13,295.00	1	1,090.94	73,340.01	175.0602	915.88	2.85
1992	Underground	Active	12	1,073.06	11.68	1,044.71	0.20%	0.96	2.37%	0.02	0.28	1.96	24.76	13,295.00	1	26,069.54	5,910,974.91	11094.5	14,975.04	11.38
1993	Underground	Active	12	974.28	11.67	947.66	0.20%	1.02	2.45%	0.02	0.29	1.94	23.21	13,295.00	1	25,730.30	2,672,071.33	5456.999	20,273.30	11.36
1994	Underground	Active	12	756.33	11.66	735.15	0.21%	0.99	2.52%	0.02	0.29	1.50	18.55	13,295.00	1	19,884.91	1,898,214.76	3861.936	16,022.98	11.35
1995	Underground	Active	6	273.19	5.83	265.32	0.21%	1.02	2.59%	0.01	0.15	0.57	6.88	13,295.00	1	7,577.89	689,585.92	1481.443	6,096.44	5.66
1996	Underground	Active	10	242.74	9.71	235.56	0.22%	1.04	2.65%	0.02	0.26	0.55	6.25	13,295.00	1	7,296.20	690,792.41	1609.351	5,686.85	9.43
1997	Underground	Active	13	239.17	12.61	231.92	0.24%	1.09	2.71%	0.03	0.34	0.60	6.29	13,295.00	1	7,938.75	774,696.78	1994.621	5,944.13	12.24
1998	Underground	Active	12	558.33	11.63	541.24	0.25%	0.99	2.76%	0.03	0.32	1.33	14.94	13,295.00	1	17,683.36	1,846,594.24	4537.971	13,145.39	11.28
1999	Underground	Active	8	117.00	7.75	113.28	0.26%	1.25	2.80%	0.02	0.22	0.37	3.18	13,295.00	1	4,911.50	293,436.69	956.9553	3,954.55	7.51
2000	Underground	Active	8	281.79	7.75	272.85	0.27%	1.08	2.84%	0.02	0.22	0.80	7.75	13,295.00	1	10,630.42	638,724.52	1871.769	8,758.65	7.51
2001	Underground	Active	5	224.71	4.84	217.67	0.28%	0.83	2.87%	0.01	0.14	0.51	6.24	13,295.00	1	6,819.84	663,532.41	1563.667	5,256.17	4.69
2002	Underground	Active	8	265.26	7.74	256.63	0.29%	1.16	2.89%	0.02	0.22	0.88	7.41	13,295.00	1	11,693.18	769,021.83	2635.56	9,057.62	7.50
2003	Underground	Active	11	998.12	10.65	965.54	0.31%	1.15	2.90%	0.03	0.31	3.40	27.98	13,295.00	1	45,233.17	4,389,854.30	15468.45	29,764.72	10.31
2004	Underground	Active	7	460.97	6.77	446.14	0.32%	1.00	2.90%	0.02	0.20	1.41	12.94	13,295.00	1	18,686.76	8,856,524.82	27902.08	-	6.56
2005	Underground	Active	7	325.84	6.78	315.44	0.32%	0.95	2.89%	0.02	0.20	0.97	9.12	13,295.00	1	12,919.99	990,956.32	3052.884	9,867.10	6.56
2006	Underground	Active	10	433.77	9.68	420.19	0.33%	0.83	2.88%	0.03	0.28	1.16	12.08	13,295.00	1	15,434.65	1,291,975.57	3569.576	11,865.08	9.37
2007	Underground	Active	12	594.07	11.62	575.10	0.34%	1.10	2.85%	0.04	0.33	2.16	16.38	13,295.00	1	28,767.90	9,194,367.48	34593.97	-	11.25
2008	Underground	Active	5	107.24	4.84	103.80	0.35%	1.25	2.81%	0.02	0.14	0.45	2.92	13,295.00	1	6,001.17	283,180.75	1231.382	4,769.78	4.69
2009	Underground	Active	6	344.39	5.82	333.98	0.35%	0.90	2.76%	0.02	0.16	1.06	9.22	13,295.00	1	14,153.36	787,243.93	2509.36	11,644.00	5.64
2010	Underground	Active	8	241.30	7.76	233.94	0.36%	1.16	2.70%	0.03	0.21	0.98	6.32	13,295.00	1	13,001.63	395,359.49	1652.719	11,348.92	7.52
2011	Underground	Active	7	201.31	6.80	195.34	0.36%	1.15	2.63%	0.02	0.18	0.82	5.13	13,295.00	1	10,874.10	580,495.50	2430.588	8,443.51	6.59
2012	Underground	Active	7	220.12	6.80	213.88	0.37%	1.05	2.54%	0.03	0.17	0.83	5.44	13,295.00	1	10,976.02	507,141.54	1957.541	9,018.48	6.60
2013	Underground	Active	14	495.72	13.62	482.26	0.37%	1.03	2.45%	0.05	0.33	1.83	11.79	13,295.00	1	24,322.63	1,328,242.95	5038.712	19,283.92	13.24
2014	Underground	Active	22	752.00	21.43	732.41	0.37%	1.06	2.33%	0.08	0.50	2.88	17.10	13,295.00	1	38,311.75	1,442,737.26	5676.414	32,635.33	20.85
2015	Underground	Active	7	157.00	6.83	153.08	0.37%	1.15	2.21%	0.03	0.15	0.65	3.38	13,295.00	1	8,700.68	342,142.56	1462.698	7,237.98	6.65
2016	Underground	Active	5	135.36	4.89	132.14	0.37%	1.25	2.07%	0.02	0.10	0.61	2.74	13,295.00	1	8,100.07	320,337.38	1476.926	6,623.15	4.77
2017	Underground	Active	7	161.03	6.85	157.50	0.36%	1.25	1.92%	0.02	0.13	0.72	3.03	13,295.00	1	9,517.20	168,377.53	765.2957	8,751.91	6.70
2018	Underground	Active	4	52.55	3.92	51.51	0.35%	1.25	1.75%	0.01	0.07	0.23	0.90	13,295.00	1	3,006.37	144,762.75	635.5335	2,370.84	3.84
2019	Underground	Active	4	149.13	3.93	146.61	0.33%	1.08	1.57%	0.01	0.06	0.52	2.31	13,295.00	1	6,887.43	387,614.80	1369.642	5,517.79	3.86
2020	Underground	Active	7	126.64	6.90	124.79	0.29%	1.25	1.38%	0.02	0.09	0.46	1.72	13,295.00	1	6,078.46	301,925.86	1106.212	4,972.25	6.79
2021	Underground	Active	7	76.97	6.92	76.09	0.24%	1.25	1.16%	0.02	0.08	0.23	0.88	13,295.00	1	3,053.54	210,030.44	633.989	2,419.55	6.83
2022	Underground	Active	4	43.22	3.97	42.88	0.17%	1.25	0.93%	0.01	0.04	0.09	0.40	13,295.00	1	1,217.68	103,698.39	221.4886	996.19	3.93
2023	Underground	Active	3	69.14	2.99	68.85	0.08%	1.25	0.69%	0.00	0.02	0.07	0.47	13,295.00	1	896.01	148,000.00	144.8768	751.14	2.96

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					2025															
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Adjusted Permit Coun (19)	Adjusted Acres (20)	Forfeiture Rate (21)	Adjustment Factor Permit Bond Size (22)	Release Rate (23)	Forfeited Permit Coun (24)	Released Permit Coun (25)	Forfeited Acres (26)	Released Acres (27)	Avg recl Cost per Acre (28)	Adjustment Factor Permit Status (29)	Gross Cost (30)	Adjustment Current Security Amount (31)	Forfeited Security Amount (32)	Net Cost (33)	Adjusted Permit Coun (34)
1965	Underground	Inactive	-	-	-	-	0.23%	-	0.35%	-	-	-	-	13,295.00	1	-	-	0	-	-
1966	Underground	Inactive	-	-	-	-	0.23%	-	0.35%	-	-	-	-	13,295.00	1	-	-	0	-	-
1967	Underground	Inactive	-	-	-	-	0.24%	-	0.36%	-	-	-	-	13,295.00	1	-	-	0	-	-
1968	Underground	Inactive	-	-	-	-	0.24%	-	0.38%	-	-	-	-	13,295.00	1	-	-	0	-	-
1969	Underground	Inactive	-	-	-	-	0.25%	-	0.40%	-	-	-	-	13,295.00	1	-	-	0	-	-
1970	Underground	Inactive	-	-	-	-	0.26%	-	0.41%	-	-	-	-	13,295.00	1	-	-	0	-	-
1971	Underground	Inactive	-	-	-	-	0.26%	-	0.43%	-	-	-	-	13,295.00	1	-	-	0	-	-
1972	Underground	Inactive	-	-	-	-	0.27%	-	0.45%	-	-	-	-	13,295.00	1	-	-	0	-	-
1973	Underground	Inactive	-	-	-	-	0.28%	-	0.47%	-	-	-	-	13,295.00	1	-	-	0	-	-
1974	Underground	Inactive	-	-	-	-	0.28%	-	0.48%	-	-	-	-	13,295.00	1	-	-	0	-	-
1975	Underground	Inactive	-	-	-	-	0.29%	-	0.50%	-	-	-	-	13,295.00	1	-	-	0	-	-
1976	Underground	Inactive	1	26.50	0.99	26.31	0.30%	0.55	0.53%	0.00	0.01	0.04	0.14	13,295.00	1	574.38	344,698.49	566.0173	8.37	0.98
1977	Underground	Inactive	-	-	-	-	0.31%	-	0.55%	-	-	-	-	13,295.00	1	-	-	0	-	-
1978	Underground	Inactive	2	117.89	1.98	116.93	0.31%	0.55	0.57%	0.01	0.01	0.20	0.67	13,295.00	1	2,685.43	504,003.50	870.5919	1,814.83	1.96
1979	Underground	Inactive	-	-	-	-	0.32%	-	0.63%	-	-	-	-	13,295.00	1	-	-	0	-	-
1980	Underground	Inactive	-	-	-	-	0.33%	-	0.70%	-	-	-	-	13,295.00	1	-	-	0	-	-
1981	Underground	Inactive	4	189.58	3.95	187.54	0.34%	0.73	0.76%	0.01	0.03	0.46	1.42	13,295.00	1	6,125.41	818,263.07	2010.183	4,115.23	3.91
1982	Underground	Inactive	1	72.51	0.99	71.73	0.35%	0.55	0.82%	0.00	0.01	0.14	0.59	13,295.00	1	1,822.77	206,234.89	394.2074	1,428.56	0.98
1983	Underground	Inactive	6	285.25	5.92	281.73	0.36%	0.78	0.88%	0.02	0.05	0.79	2.49	13,295.00	1	10,458.50	854,841.90	2386.864	8,071.63	5.85
1984	Underground	Inactive	-	-	-	-	0.37%	-	0.95%	-	-	-	-	13,295.00	1	-	-	0	-	-
1985	Underground	Inactive	1	220.21	0.99	217.10	0.37%	0.90	1.01%	0.00	0.01	0.73	2.19	13,295.00	1	9,740.24	572,611.21	1932.362	7,807.88	0.97
1986	Underground	Inactive	1	43.54	0.98	42.95	0.38%	0.55	1.07%	0.00	0.01	0.09	0.46	13,295.00	1	1,207.94	290,666.06	614.8066	593.13	0.97
1987	Underground	Inactive	1	40.89	0.98	40.31	0.39%	0.55	1.13%	0.00	0.01	0.09	0.45	13,295.00	1	1,162.77	160,398.31	347.968	814.80	0.97
1988	Underground	Inactive	6	73.42	5.90	72.15	0.40%	1.19	1.18%	0.02	0.07	0.35	0.85	13,295.00	1	4,624.14	1,192,619.79	5749.486	-	5.81
1989	Underground	Inactive	2	193.50	1.97	190.54	0.41%	0.55	1.24%	0.01	0.02	0.43	2.36	13,295.00	1	5,781.14	611,951.31	1396.52	4,384.62	1.93
1990	Underground	Inactive	4	47.64	3.93	46.78	0.43%	1.08	1.29%	0.02	0.05	0.21	0.61	13,295.00	1	2,844.98	230,357.05	1053.836	1,791.14	3.86
1991	Underground	Inactive	3	362.42	2.94	355.72	0.44%	1.02	1.35%	0.01	0.04	1.58	4.79	13,295.00	1	20,986.02	1,475,927.94	6549.409	14,436.61	2.89
1992	Underground	Inactive	1	9.00	0.98	8.82	0.45%	1.25	1.39%	0.00	0.01	0.05	0.12	13,295.00	1	656.08	21,118.10	118.1731	537.91	0.96
1993	Underground	Inactive	2	35.86	1.96	35.18	0.46%	0.90	1.44%	0.01	0.03	0.15	0.51	13,295.00	1	1,932.52	427,697.59	1767.374	165.14	1.92
1994	Underground	Inactive	2	100.78	1.96	98.98	0.47%	0.55	1.48%	0.01	0.03	0.26	1.47	13,295.00	1	3,408.20	288,910.48	748.291	2,659.91	1.92
1995	Underground	Inactive	6	182.46	5.88	178.99	0.48%	0.67	1.52%	0.03	0.09	0.58	2.73	13,295.00	1	7,662.33	1,479,429.20	4763.683	2,898.65	5.76
1996	Underground	Inactive	3	55.21	2.94	53.96	0.51%	1.25	1.56%	0.02	0.05	0.35	0.84	13,295.00	1	4,591.27	128,406.27	821.8415	3,769.43	2.88
1997	Underground	Inactive	6	282.76	5.87	276.53	0.54%	1.02	1.59%	0.03	0.09	1.52	4.41	13,295.00	1	20,209.25	1,560,364.91	8577.135	11,632.11	5.74
1998	Underground	Inactive	1	72.14	0.98	70.56	0.57%	0.90	1.62%	0.01	0.02	0.36	1.15	13,295.00	1	4,802.67	577,561.70	2956.759	1,845.91	0.96
1999	Underground	Inactive	10	606.66	9.77	592.33	0.60%	1.11	1.65%	0.06	0.16	3.92	9.77	13,295.00	1	52,127.21	1,796,769.42	11893.36	40,233.85	9.55
2000	Underground	Inactive	8	256.24	7.81	249.98	0.62%	1.16	1.67%	0.05	0.13	1.81	4.18	13,295.00	1	24,073.92	758,633.14	5495.117	18,578.80	7.63
2001	Underground	Inactive	2	6.00	1.95	5.85	0.65%	1.25	1.69%	0.01	0.03	0.05	0.10	13,295.00	1	630.67	90,313.81	732.6394	-	1.91
2002	Underground	Inactive	1	47.21	0.98	46.11	0.67%	0.90	1.70%	0.01	0.02	0.28	0.78	13,295.00	1	3,717.73	997,934.60	6052.125	-	0.95
2003	Underground	Inactive	5	212.02	4.88	207.24	0.70%	0.76	1.70%	0.03	0.08	1.10	3.53	13,295.00	1	14,607.94	1,534,400.34	8135.045	6,472.90	4.76
2004	Underground	Inactive	3	180.23	2.93	176.43	0.72%	0.55	1.71%	0.02	0.05	0.70	3.01	13,295.00	1	9,289.99	783,791.58	3104.262	6,185.73	2.86
2005	Underground	Inactive	5	124.90	4.88	121.73	0.74%	1.11	1.70%	0.04	0.08	1.00	2.07	13,295.00	1	13,315.96	362,234.66	2980.349	10,335.61	4.76
2006	Underground	Inactive	6	160.75	5.85	156.78	0.76%	1.02	1.69%	0.04	0.10	1.21	2.65	13,295.00	1	16,124.11	565,207.66	4372.128	11,751.98	5.71
2007	Underground	Inactive	3	107.80	2.93	105.35	0.78%	0.78	1.68%	0.02	0.05	0.64	1.76	13,295.00	1	8,545.21	334,423.96	2040.375	6,504.84	2.85
2008	Underground	Inactive	4	79.05	3.90	76.97	0.80%	1.25	1.65%	0.03	0.06	0.76	1.27	13,295.00	1	10,170.47	218,763.67	2174.335	7,996.14	3.81
2009	Underground	Inactive	7	111.36	6.83	108.54	0.81%	1.15	1.62%	0.06	0.11	1.01	1.76	13,295.00	1	13,433.98	320,462.02	2983.372	10,450.61	6.67
2010	Underground	Inactive	9	161.54	8.79	157.47	0.82%	1.17	1.59%	0.07	0.14	1.52	2.50	13,295.00	1	20,170.90	586,206.96	5648.028	14,522.87	8.57
2011	Underground	Inactive	7	129.26	6.84	126.08	0.83%	1.15	1.55%	0.06	0.11	1.21	1.95	13,295.00	1	16,042.10	432,917.89	4143.239	11,898.86	6.67
2012	Underground	Inactive	1	32.84	0.98	32.21	0.84%	0.55	1.50%	0.01	0.01	0.15	0.48	13,295.00	1	1,979.35	321,395.66	1485.31	494.04	0.95
2013	Underground	Inactive	2	44.71	1.96	43.62	0.85%	1.25	1.44%	0.02	0.03	0.46	0.63	13,295.00	1	6,132.51	129,134.64	1365.504	4,767.01	1.91
2014	Underground	Inactive	1	12.00	0.98	11.72	0.85%	1.25	1.37%	0.01	0.01	0.12	0.16	13,295.00	1	1,653.37	34,667.83	367.9698	1,285.41	0.96
2015	Underground	Inactive	1	16.83	0.98	16.45	0.85%	1.25	1.30%	0.01	0.01	0.17	0.21	13,295.00	1	2,322.56	31,623.19	335.8826	1,986.68	0.96
2016	Underground	Inactive	1	13.42	0.98	13.13	0.84%	1.25	1.22%	0.01	0.01	0.14	0.16	13,295.00	1	1,839.46	30,480.02	321.2095	1,518.25	0.96
2017	Underground	Inactive	-	-	-	-	0.83%	-	1.13%	-	-	-	-	13,295.00	1	-	-	0	-	-
2018	Underground	Inactive	1	37.86	0.98	37.15	0.80%	1.25	1.03%	0.01	0.01	0.37	0.38	13,295.00	1	4,956.79	60,783.74	609.9454	4,346.85	0.97
2019	Underground	Inactive	-	-	-	-	0.75%	-	0.92%	-	-	-	-	13,295.00	1	-	-	0	-	-
2020	Underground	Inactive	-	-	-	-	0.67%	-	0.81%	-	-	-	-	13,295.00	1	-	-	0	-	-
2021	Underground	Inactive	-	-	-	-	0.55%	-	0.68%	-	-	-	-	13,295.00	1	-	-	0	-	-
2022	Underground	Inactive	-	-	-	-	0.39%	-	0.55%	-	-	-	-	13,295.00	1	-	-	0	-	-
2023	Underground	Inactive	-	-	-	-	0.18%	-	0.40%	-	-	-	-	13,295.00	1	-	-	0	-	-

West Virginia Department of Environmental Protection Office of Special Reclam
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model

					2025																
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Adjusted Permit Coun (19)	Adjusted Acres (20)	Forfeiture Rate (21)	Adjustment Factor Permit Bond Size (22)	Release Rate (23)	Forfeited Permit Coun (24)	Released Permit Coun (25)	Forfeited Acres (26)	Released Acres (27)	Avg recl Cost per Acre (28)	Adjustment Factor Permit Status (29)	Gross Cost (30)	Adjustment Current Security Amount (31)	Forfeited Security Amount (32)	Net Cost (33)	Adjusted Permit Coun (34)
1965	Underground	Phased Released	-	-	-	-	0.27%	-	1.61%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1966	Underground	Phased Released	-	-	-	-	0.27%	-	1.61%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1967	Underground	Phased Released	-	-	-	-	0.27%	-	1.68%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1968	Underground	Phased Released	-	-	-	-	0.28%	-	1.75%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1969	Underground	Phased Released	-	-	-	-	0.29%	-	1.82%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1970	Underground	Phased Released	-	-	-	-	0.30%	-	1.89%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1971	Underground	Phased Released	-	-	-	-	0.30%	-	1.97%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1972	Underground	Phased Released	-	-	-	-	0.31%	-	2.05%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1973	Underground	Phased Released	-	-	-	-	0.32%	-	2.14%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1974	Underground	Phased Released	-	-	-	-	0.33%	-	2.23%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1975	Underground	Phased Released	-	-	-	-	0.34%	-	2.32%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1976	Underground	Phased Released	-	-	-	-	0.35%	-	2.42%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1977	Underground	Phased Released	-	-	-	-	0.35%	-	2.52%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
1978	Underground	Phased Released	3	10.58	2.90	10.22	0.36%	1.25	2.63%	0.01	0.08	0.05	0.27	13,295.00	0.5	308.46	24,186.87	109.7892	198.67	2.81
1979	Underground	Phased Released	2	59.68	1.93	57.48	0.37%	1.25	2.91%	0.01	0.06	0.27	1.67	13,295.00	0.5	1,779.04	101,242.25	471.3433	1,307.70	1.87
1980	Underground	Phased Released	5	87.19	4.81	83.72	0.38%	1.25	3.20%	0.02	0.15	0.40	2.68	13,295.00	0.5	2,657.40	49,755.13	237.5794	2,419.82	4.63
1981	Underground	Phased Released	6	66.33	5.75	63.52	0.39%	1.13	3.49%	0.02	0.20	0.28	2.22	13,295.00	0.5	1,874.94	191,245.05	849.1886	1,025.76	5.53
1982	Underground	Phased Released	3	194.36	2.87	185.45	0.40%	1.25	3.78%	0.01	0.11	0.93	7.01	13,295.00	0.5	6,192.32	79,882.33	401.2476	5,791.07	2.75
1983	Underground	Phased Released	5	70.38	4.76	66.94	0.41%	1.25	4.07%	0.02	0.19	0.34	2.72	13,295.00	0.5	2,292.61	64,123.38	330.3494	1,962.26	4.55
1984	Underground	Phased Released	1	80.60	0.95	76.67	0.42%	0.55	4.35%	0.00	0.04	0.18	3.34	13,295.00	0.5	1,184.95	130,408.30	303.1869	881.77	0.90
1985	Underground	Phased Released	3	17.24	2.84	16.30	0.43%	1.25	4.63%	0.01	0.13	0.09	0.76	13,295.00	0.5	587.12	30,549.25	165.5573	421.56	2.70
1986	Underground	Phased Released	3	118.96	2.83	112.12	0.44%	1.25	4.91%	0.01	0.14	0.62	5.51	13,295.00	0.5	4,142.57	118,456.83	658.4205	3,484.15	2.68
1987	Underground	Phased Released	3	67.09	2.82	63.04	0.46%	1.25	5.18%	0.01	0.15	0.36	3.27	13,295.00	0.5	2,389.10	77,504.17	441.8386	1,947.26	2.66
1988	Underground	Phased Released	6	197.49	5.63	185.04	0.47%	1.25	5.45%	0.03	0.31	1.08	10.08	13,295.00	0.5	7,192.19	214,585.38	1254.683	5,937.51	5.30
1989	Underground	Phased Released	5	80.68	4.68	75.38	0.48%	1.25	5.70%	0.02	0.27	0.45	4.30	13,295.00	0.5	3,005.09	53,985.89	323.7499	2,681.34	4.39
1990	Underground	Phased Released	2	18.31	1.87	17.06	0.49%	1.25	5.95%	0.01	0.11	0.10	1.02	13,295.00	0.5	697.59	19,873.83	122.238	575.35	1.75
1991	Underground	Phased Released	3	23.22	2.79	21.58	0.50%	1.25	6.19%	0.01	0.17	0.14	1.34	13,295.00	0.5	904.98	29,805.89	188.0279	716.95	2.61
1992	Underground	Phased Released	2	39.95	1.86	37.04	0.52%	1.25	6.41%	0.01	0.12	0.24	2.38	13,295.00	0.5	1,592.99	37,708.09	243.9777	1,349.01	1.73
1993	Underground	Phased Released	4	68.38	3.71	63.25	0.53%	1.25	6.63%	0.02	0.25	0.42	4.19	13,295.00	0.5	2,789.98	67,987.49	451.1697	2,338.81	3.44
1994	Underground	Phased Released	2	18.79	1.85	17.34	0.54%	1.25	6.83%	0.01	0.13	0.12	1.18	13,295.00	0.5	784.59	19,860.39	135.1743	649.41	1.71
1995	Underground	Phased Released	3	60.54	2.77	55.74	0.56%	1.25	7.01%	0.02	0.19	0.39	3.91	13,295.00	0.5	2,586.75	63,359.62	442.2973	2,144.45	2.56
1996	Underground	Phased Released	4	133.37	3.68	122.54	0.59%	1.25	7.18%	0.02	0.26	0.91	8.80	13,295.00	0.5	6,028.42	93,013.43	688.334	5,340.08	3.40
1997	Underground	Phased Released	4	119.99	3.67	110.04	0.63%	1.25	7.34%	0.02	0.27	0.86	8.07	13,295.00	0.5	5,716.15	104,842.92	819.2913	4,896.85	3.38
1998	Underground	Phased Released	2	64.00	1.83	58.59	0.66%	1.25	7.47%	0.01	0.14	0.48	4.38	13,295.00	0.5	3,202.11	64,820.46	532.904	2,669.20	1.69
1999	Underground	Phased Released	2	246.00	1.83	225.50	0.69%	0.90	7.59%	0.01	0.14	1.40	17.11	13,295.00	0.5	9,302.36	251,359.54	1559.835	7,742.52	1.68
2000	Underground	Phased Released	2	59.65	1.83	54.46	0.72%	1.25	7.68%	0.01	0.14	0.49	4.18	13,295.00	0.5	3,260.37	49,071.56	441.9201	2,818.45	1.68
2001	Underground	Phased Released	4	36.60	3.66	33.38	0.75%	1.25	7.76%	0.03	0.28	0.31	2.59	13,295.00	0.5	2,081.56	51,564.86	483.6617	1,597.90	3.35
2002	Underground	Phased Released	1	48.55	0.91	44.25	0.78%	1.25	7.81%	0.01	0.07	0.43	3.46	13,295.00	0.5	2,865.03	15,680.29	152.7141	2,712.31	0.84
2003	Underground	Phased Released	2	31.05	1.83	28.29	0.81%	1.25	7.84%	0.01	0.14	0.29	2.22	13,295.00	0.5	1,896.12	29,460.16	297.0329	1,599.09	1.67
2004	Underground	Phased Released	-	-	-	-	0.83%	-	7.85%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2005	Underground	Phased Released	1	21.73	0.91	19.80	0.86%	1.25	7.83%	0.01	0.07	0.21	1.55	13,295.00	0.5	1,410.10	11,096.62	118.8794	1,291.22	0.83
2006	Underground	Phased Released	-	-	-	-	0.88%	-	7.78%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2007	Underground	Phased Released	-	-	-	-	0.90%	-	7.71%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2008	Underground	Phased Released	3	63.64	2.75	58.14	0.92%	1.25	7.60%	0.03	0.21	0.67	4.42	13,295.00	0.5	4,441.71	36,982.18	425.0063	4,016.71	2.51
2009	Underground	Phased Released	2	54.60	1.83	49.96	0.94%	1.25	7.47%	0.02	0.14	0.58	3.73	13,295.00	0.5	3,885.97	71,761.26	839.6241	3,046.34	1.68
2010	Underground	Phased Released	-	-	-	-	0.95%	-	7.31%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2011	Underground	Phased Released	1	25.60	0.92	23.53	0.96%	1.25	7.11%	0.01	0.07	0.28	1.67	13,295.00	0.5	1,881.22	30,821.09	370.7203	1,510.50	0.85
2012	Underground	Phased Released	-	-	-	-	0.97%	-	6.88%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2013	Underground	Phased Released	-	-	-	-	0.98%	-	6.62%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2014	Underground	Phased Released	-	-	-	-	0.98%	-	6.32%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2015	Underground	Phased Released	-	-	-	-	0.98%	-	5.98%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2016	Underground	Phased Released	-	-	-	-	0.97%	-	5.61%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2017	Underground	Phased Released	-	-	-	-	0.96%	-	5.20%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2018	Underground	Phased Released	-	-	-	-	0.93%	-	4.75%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2019	Underground	Phased Released	-	-	-	-	0.87%	-	4.25%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2020	Underground	Phased Released	-	-	-	-	0.77%	-	3.72%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2021	Underground	Phased Released	-	-	-	-	0.64%	-	3.14%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2022	Underground	Phased Released	-	-	-	-	0.45%	-	2.52%	-	-	-	-	13,295.00	0.5	-	-	0	-	-
2023	Underground	Phased Released	-	-	-	-	0.21%	-	1.86%	-	-	-	-	13,295.00	0.5	-	-	0	-	-

West Virginia Department of Environmental Protection Office of Special Reclam
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model

					2025																
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Adjusted Permit Coun	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Coun	Released Permit Coun	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Adjustment Current Security Amount	Forfeited Security Amount	Net Cost	Adjusted Permit Coun
(1)	(2)	(3)	(4)	(5)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
1965	Other	Active	-	-	-	-	0.15%	-	1.97%	-	-	-	-	9,310.00	1	-	-	0	-	-
1966	Other	Active	-	-	-	-	0.15%	-	1.97%	-	-	-	-	9,310.00	1	-	-	0	-	-
1967	Other	Active	-	-	-	-	0.15%	-	2.01%	-	-	-	-	9,310.00	1	-	-	0	-	-
1968	Other	Active	-	-	-	-	0.15%	-	2.06%	-	-	-	-	9,310.00	1	-	-	0	-	-
1969	Other	Active	-	-	-	-	0.16%	-	2.10%	-	-	-	-	9,310.00	1	-	-	0	-	-
1970	Other	Active	-	-	-	-	0.16%	-	2.14%	-	-	-	-	9,310.00	1	-	-	0	-	-
1971	Other	Active	-	-	-	-	0.17%	-	2.18%	-	-	-	-	9,310.00	1	-	-	0	-	-
1972	Other	Active	1	20.00	0.98	19.50	0.17%	1.25	2.23%	0.00	0.02	0.04	0.43	9,310.00	1	386.87	19,956.29	42.52414	344.35	0.95
1973	Other	Active	-	-	-	-	0.17%	-	2.27%	-	-	-	-	9,310.00	1	-	-	0	-	-
1974	Other	Active	1	28.52	0.97	27.78	0.18%	1.25	2.32%	0.00	0.02	0.06	0.64	9,310.00	1	579.71	28,933.33	64.85522	514.86	0.95
1975	Other	Active	1	6.20	0.97	6.04	0.18%	1.25	2.37%	0.00	0.02	0.01	0.14	9,310.00	1	129.18	10,475.24	24.08274	105.10	0.95
1976	Other	Active	-	-	-	-	0.19%	-	2.42%	-	-	-	-	9,310.00	1	-	-	0	-	-
1977	Other	Active	4	223.99	3.89	217.88	0.19%	1.08	2.47%	0.01	0.10	0.45	5.37	9,310.00	1	4,218.81	234,498.70	487.7211	3,731.09	3.79
1978	Other	Active	-	-	-	-	0.20%	-	2.52%	-	-	-	-	9,310.00	1	-	-	0	-	-
1979	Other	Active	1	65.00	0.97	63.16	0.20%	1.25	2.57%	0.00	0.02	0.16	1.62	9,310.00	1	1,495.94	64,830.40	164.9309	1,331.01	0.95
1980	Other	Active	7	364.74	6.81	354.65	0.21%	1.05	2.57%	0.01	0.17	0.78	9.11	9,310.00	1	7,236.89	475,169.42	1041.47	6,195.42	6.62
1981	Other	Active	38	5,211.96	36.97	5,072.15	0.21%	0.91	2.54%	0.08	0.94	9.87	128.86	9,310.00	1	91,920.11	21,429,121.69	41713.15	50,206.95	35.95
1982	Other	Active	5	586.43	4.87	571.17	0.22%	0.90	2.48%	0.01	0.12	1.13	14.18	9,310.00	1	10,508.83	1,678,550.79	3317.238	7,191.59	4.74
1983	Other	Active	36	3,861.09	35.09	3,764.75	0.23%	0.86	2.40%	0.08	0.84	7.30	90.36	9,310.00	1	67,973.61	10,403,216.06	20175.38	47,798.23	34.17
1984	Other	Active	31	4,421.79	30.25	4,317.64	0.23%	0.76	2.30%	0.07	0.69	7.62	99.14	9,310.00	1	70,986.03	12,788,295.49	22583.42	48,402.62	29.49
1985	Other	Active	13	1,543.19	12.70	1,507.86	0.24%	1.03	2.17%	0.03	0.28	3.70	32.79	9,310.00	1	34,409.24	4,672,404.11	11452.63	22,956.62	12.40
1986	Other	Active	13	1,384.69	12.72	1,355.21	0.24%	0.95	2.04%	0.03	0.26	3.14	27.62	9,310.00	1	29,242.67	4,957,068.27	11489.06	17,753.62	12.43
1987	Other	Active	7	974.10	6.86	954.69	0.25%	1.00	1.89%	0.02	0.13	2.38	18.05	9,310.00	1	22,150.87	3,821,925.87	9524.863	12,626.01	6.71
1988	Other	Active	9	618.27	8.83	606.80	0.26%	1.06	1.74%	0.02	0.15	1.64	10.54	9,310.00	1	15,242.27	1,707,262.47	4606.311	10,635.96	8.66
1989	Other	Active	7	290.43	6.88	285.41	0.26%	1.15	1.58%	0.02	0.11	0.86	4.50	9,310.00	1	8,010.94	305,053.80	919.6902	7,091.25	6.76
1990	Other	Active	5	344.46	4.92	339.19	0.27%	0.97	1.42%	0.01	0.07	0.88	4.81	9,310.00	1	8,236.09	421,469.53	1099.26	7,136.83	4.84
1991	Other	Active	6	491.29	5.92	484.16	0.28%	1.19	1.26%	0.02	0.07	1.59	6.12	9,310.00	1	14,813.21	1,369,847.17	4501.787	10,311.43	5.83
1992	Other	Active	10	391.14	9.87	386.14	0.28%	1.04	1.11%	0.03	0.11	1.14	4.30	9,310.00	1	10,575.11	938,320.48	2760.183	7,814.93	9.74
1993	Other	Active	10	946.05	9.89	935.77	0.29%	0.80	0.98%	0.03	0.10	2.16	9.13	9,310.00	1	20,092.48	2,194,317.17	5060.755	15,031.72	9.76
1994	Other	Active	13	2,315.41	12.86	2,292.06	0.30%	0.87	0.85%	0.04	0.11	5.95	19.49	9,310.00	1	55,433.49	6,665,393.58	17315	38,118.49	12.72
1995	Other	Active	6	950.69	5.94	941.27	0.31%	1.08	0.74%	0.02	0.04	3.09	6.98	9,310.00	1	28,748.31	5,408,652.19	17743.41	11,004.90	5.88
1996	Other	Active	3	1,971.02	2.97	1,954.42	0.31%	0.78	0.65%	0.01	0.02	4.79	12.79	9,310.00	1	44,611.78	9,701,093.68	23784.95	20,826.83	2.94
1997	Other	Active	11	1,403.71	10.90	1,391.77	0.32%	0.90	0.59%	0.03	0.06	4.02	8.22	9,310.00	1	37,435.95	2,620,850.68	7572.079	29,863.87	10.80
1998	Other	Active	5	1,144.42	4.96	1,134.11	0.33%	1.04	0.55%	0.02	0.03	3.88	6.29	9,310.00	1	36,154.71	785,750.72	2690.567	33,464.14	4.91
1999	Other	Active	5	404.95	4.95	401.25	0.34%	0.97	0.55%	0.02	0.03	1.31	2.20	9,310.00	1	12,236.36	957,133.57	3135.201	9,101.16	4.91
2000	Other	Active	1	222.50	0.99	220.35	0.35%	0.90	0.58%	0.00	0.01	0.69	1.28	9,310.00	1	6,394.73	924,714.13	2882.481	3,512.25	0.98
2001	Other	Active	5	381.08	4.94	377.05	0.36%	0.83	0.65%	0.02	0.03	1.11	2.44	9,310.00	1	10,349.92	779,555.45	2298.46	8,051.46	4.89
2002	Other	Active	8	818.79	7.90	807.79	0.36%	1.16	0.76%	0.03	0.06	3.42	6.10	9,310.00	1	31,852.67	2,107,213.21	8925.01	22,927.66	7.81
2003	Other	Active	6	908.39	5.91	894.34	0.37%	1.13	0.91%	0.02	0.05	3.79	8.13	9,310.00	1	35,262.51	4,613,925.25	19540.28	15,722.23	5.83
2004	Other	Active	8	1,149.70	7.85	1,128.82	0.38%	0.99	1.11%	0.03	0.09	4.27	12.55	9,310.00	1	39,775.04	3,759,473.16	14228.6	25,546.44	7.74
2005	Other	Active	2	23.99	1.96	23.47	0.45%	0.90	1.37%	0.01	0.03	0.10	0.32	9,310.00	1	894.38	187,691.47	768.1827	126.20	1.92
2006	Other	Active	7	491.96	6.81	478.82	0.54%	1.00	1.68%	0.04	0.11	2.56	8.03	9,310.00	1	23,860.29	1,321,028.90	7070.781	16,789.51	6.66
2007	Other	Active	6	394.47	5.81	381.62	0.63%	1.08	2.05%	0.04	0.12	2.56	7.81	9,310.00	1	23,878.87	1,102,379.78	7409.044	16,469.82	5.65
2008	Other	Active	7	599.63	6.73	576.28	0.73%	1.10	2.48%	0.05	0.17	4.60	14.28	9,310.00	1	42,792.38	1,590,766.96	12687.91	30,104.48	6.52
2009	Other	Active	4	174.78	3.82	166.79	0.84%	1.08	2.98%	0.03	0.11	1.50	4.96	9,310.00	1	13,944.59	178,149.21	1599.799	12,344.79	3.67
2010	Other	Active	9	1,066.83	8.53	1,010.90	0.96%	0.98	3.54%	0.08	0.30	9.45	35.81	9,310.00	1	88,018.67	4,374,744.81	40913.7	47,104.97	8.14
2011	Other	Active	4	365.79	3.76	343.90	1.08%	0.90	4.18%	0.04	0.16	3.36	14.38	9,310.00	1	31,242.36	438,743.30	4281.288	26,961.07	3.56
2012	Other	Active	8	213.57	7.44	198.17	1.21%	1.16	4.90%	0.09	0.36	2.78	9.71	9,310.00	1	25,878.18	367,326.35	5152.283	20,725.90	6.99
2013	Other	Active	18	2,100.30	16.57	1,933.76	1.30%	1.00	5.70%	0.22	0.94	25.14	110.13	9,310.00	1	234,095.80	3,730,265.92	48504.5	185,591.30	15.41
2014	Other	Active	8	282.83	7.29	256.89	1.36%	1.21	6.58%	0.10	0.48	4.21	16.89	9,310.00	1	39,180.43	651,919.91	10679.9	28,500.53	6.71
2015	Other	Active	9	1,105.29	8.10	992.54	1.35%	1.13	7.54%	0.11	0.61	15.20	74.86	9,310.00	1	141,486.75	2,810,438.67	43032.01	98,454.74	7.38
2016	Other	Active	6	1,513.50	5.25	1,321.30	1.26%	1.13	8.77%	0.07	0.46	18.94	115.85	9,310.00	1	176,286.86	288,536.07	4134.945	172,151.92	4.72
2017	Other	Active	6	385.95	4.97	319.30	1.10%	1.13	11.45%	0.05	0.57	3.98	36.57	9,310.00	1	37,073.67	249,818.09	3115.611	33,958.06	4.35
2018	Other	Active	2	21.89	1.55	16.91	0.86%	1.25	16.29%	0.01	0.25	0.18	2.75	9,310.00	1	1,694.29	18,362.18	197.6358	1,496.66	1.28
2019	Other	Active	5	6.47	3.65	4.72	0.60%	1.25	22.01%	0.02	0.80	0.04	1.04	9,310.00	1	327.05	3,982.95	29.67199	297.37	2.82
2020	Other	Active	6	563.58	4.29	402.48	0.34%	1.13	26.67%	0.01	1.14	1.56	107.34	9,310.00	1	14,480.64	160,798.58	621.4038	13,859.24	3.13
2021	Other	Active	16	122.97	11.96	91.90	0.19%	1.25	28.37%	0.02	3.39	0.21	26.07	9,310.00	1	1,999.29	86,464.39	202.0549	1,797.24	8.54
2022	Other	Active	35	605.48	29.63	512.56	0.03%	1.21	25.23%	0.01	7.48	0.20	129.31	9,310.00	1	1,901.79	486,140.00	193.7432	1,708.05	22.14
2023	Other	Active	55	863.80	55.00	863.80	0.00%	1.25	15.35%	-	8.44	-	132.56	9,310.00	1	-	238,280.00	0	-	46.56

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					2025																
Permit Issue Year	Mine Type	Mine Status	Permit Count	Current Bonded Acres	Adjusted Permit Coun	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Permit Coun	Released Permit Coun	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost	Adjustment Current Security Amount	Forfeited Security Amount	Net Cost	Adjusted Permit Coun
(1)	(2)	(3)	(4)	(5)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
1965	Other	Inactive	-	-	-	-	0.33%	-	1.16%	-	-	-	-	9,310.00	1	-	-	0	-	-
1966	Other	Inactive	-	-	-	-	0.33%	-	1.16%	-	-	-	-	9,310.00	1	-	-	0	-	-
1967	Other	Inactive	-	-	-	-	0.34%	-	1.19%	-	-	-	-	9,310.00	1	-	-	0	-	-
1968	Other	Inactive	-	-	-	-	0.35%	-	1.21%	-	-	-	-	9,310.00	1	-	-	0	-	-
1969	Other	Inactive	-	-	-	-	0.36%	-	1.23%	-	-	-	-	9,310.00	1	-	-	0	-	-
1970	Other	Inactive	-	-	-	-	0.37%	-	1.26%	-	-	-	-	9,310.00	1	-	-	0	-	-
1971	Other	Inactive	-	-	-	-	0.38%	-	1.29%	-	-	-	-	9,310.00	1	-	-	0	-	-
1972	Other	Inactive	-	-	-	-	0.39%	-	1.31%	-	-	-	-	9,310.00	1	-	-	0	-	-
1973	Other	Inactive	-	-	-	-	0.40%	-	1.34%	-	-	-	-	9,310.00	1	-	-	0	-	-
1974	Other	Inactive	-	-	-	-	0.41%	-	1.37%	-	-	-	-	9,310.00	1	-	-	0	-	-
1975	Other	Inactive	-	-	-	-	0.42%	-	1.39%	-	-	-	-	9,310.00	1	-	-	0	-	-
1976	Other	Inactive	1	14.48	0.98	14.19	0.43%	1.25	1.42%	0.00	0.01	0.08	0.20	9,310.00	1	712.01	14,917.08	80.39761	631.62	0.96
1977	Other	Inactive	-	-	-	-	0.44%	-	1.45%	-	-	-	-	9,310.00	1	-	-	0	-	-
1978	Other	Inactive	-	-	-	-	0.45%	-	1.48%	-	-	-	-	9,310.00	1	-	-	0	-	-
1979	Other	Inactive	1	7.25	0.98	7.10	0.47%	1.25	1.51%	0.00	0.01	0.04	0.11	9,310.00	1	384.22	9,940.36	57.80261	326.42	0.96
1980	Other	Inactive	1	114.75	0.98	112.73	0.48%	0.55	1.51%	0.00	0.01	0.30	1.70	9,310.00	1	2,754.03	339,483.83	890.8663	1,863.16	0.96
1981	Other	Inactive	6	707.84	5.88	694.10	0.49%	0.96	1.49%	0.03	0.09	3.26	10.37	9,310.00	1	30,304.90	1,830,990.51	8586.75	21,718.15	5.77
1982	Other	Inactive	2	127.20	1.96	124.81	0.50%	0.90	1.46%	0.01	0.03	0.56	1.82	9,310.00	1	5,249.04	372,267.27	1681.585	3,567.45	1.92
1983	Other	Inactive	7	1,078.40	6.87	1,058.43	0.51%	0.95	1.41%	0.04	0.10	5.18	14.94	9,310.00	1	48,189.27	6,438,894.31	31488.49	16,700.79	6.74
1984	Other	Inactive	7	440.78	6.87	432.99	0.53%	0.90	1.35%	0.04	0.09	2.06	5.85	9,310.00	1	19,155.20	6,994,825.04	33237.75	-	6.74
1985	Other	Inactive	4	1,198.15	3.93	1,177.21	0.54%	0.99	1.28%	0.02	0.05	6.30	15.06	9,310.00	1	58,607.07	3,774,484.53	20183.78	38,423.30	3.86
1986	Other	Inactive	-	-	-	-	0.56%	-	1.20%	-	-	-	-	9,310.00	1	-	-	0	-	-
1987	Other	Inactive	-	-	-	-	0.57%	-	1.11%	-	-	-	-	9,310.00	1	-	-	0	-	-
1988	Other	Inactive	1	29.83	0.98	29.33	0.58%	1.25	1.02%	0.01	0.01	0.21	0.30	9,310.00	1	1,994.16	29,775.29	217.4502	1,776.71	0.97
1989	Other	Inactive	4	414.41	3.94	408.21	0.60%	1.08	0.93%	0.02	0.04	2.63	3.79	9,310.00	1	24,481.22	1,180,747.12	7605.969	16,875.25	3.88
1990	Other	Inactive	3	481.66	2.96	474.64	0.61%	1.13	0.83%	0.02	0.02	3.31	3.96	9,310.00	1	30,779.03	1,536,941.18	10705.32	20,073.71	2.92
1991	Other	Inactive	-	-	-	-	0.63%	-	0.74%	-	-	-	-	9,310.00	1	-	-	0	-	-
1992	Other	Inactive	3	332.18	2.96	327.78	0.65%	1.13	0.66%	0.02	0.02	2.40	2.15	9,310.00	1	22,359.46	1,061,958.96	7781.096	14,578.36	2.92
1993	Other	Inactive	3	163.11	2.96	161.17	0.66%	1.02	0.57%	0.02	0.02	1.09	0.93	9,310.00	1	10,115.17	260,267.91	1754.567	8,360.61	2.93
1994	Other	Inactive	2	395.55	1.98	390.86	0.68%	1.08	0.50%	0.01	0.01	2.86	1.96	9,310.00	1	26,603.74	954,151.32	6975.765	19,627.97	1.95
1995	Other	Inactive	3	641.22	2.97	633.55	0.70%	1.13	0.44%	0.02	0.01	5.01	2.77	9,310.00	1	46,628.54	2,158,436.31	17063.12	29,565.42	2.93
1996	Other	Inactive	1	152.16	0.99	151.02	0.72%	0.55	0.38%	0.01	0.00	0.59	0.58	9,310.00	1	5,532.17	481,608.51	1895.02	3,637.15	0.98
1997	Other	Inactive	1	5.95	0.99	5.91	0.73%	0.55	0.35%	0.01	0.00	0.02	0.02	9,310.00	1	221.90	183,238.40	739.4886	-	0.98
1998	Other	Inactive	1	117.09	0.99	116.21	0.75%	0.55	0.33%	0.01	0.00	0.48	0.38	9,310.00	1	4,478.37	366,597.06	1517.397	2,960.98	0.98
1999	Other	Inactive	-	-	-	-	0.77%	-	0.32%	-	-	-	-	9,310.00	1	-	-	0	-	-
2000	Other	Inactive	1	116.73	0.99	115.76	0.79%	0.55	0.34%	0.01	0.00	0.50	0.39	9,310.00	1	4,692.75	116,477.50	507.1579	4,185.59	0.98
2001	Other	Inactive	1	144.00	0.99	142.70	0.81%	0.55	0.38%	0.01	0.00	0.64	0.54	9,310.00	1	5,932.96	143,340.44	640.1257	5,292.84	0.98
2002	Other	Inactive	-	-	-	-	0.83%	-	0.44%	-	-	-	-	9,310.00	1	-	-	0	-	-
2003	Other	Inactive	-	-	-	-	0.85%	-	0.54%	-	-	-	-	9,310.00	1	-	-	0	-	-
2004	Other	Inactive	1	56.00	0.98	54.82	0.88%	1.25	0.65%	0.01	0.01	0.60	0.36	9,310.00	1	5,589.02	55,272.39	605.2548	4,983.77	0.97
2005	Other	Inactive	1	50.69	0.98	49.41	1.04%	1.25	0.80%	0.01	0.01	0.64	0.40	9,310.00	1	5,977.45	50,220.07	652.5093	5,324.94	0.96
2006	Other	Inactive	-	-	-	-	1.22%	-	0.99%	-	-	-	-	9,310.00	1	-	-	0	-	-
2007	Other	Inactive	-	-	-	-	1.43%	-	1.20%	-	-	-	-	9,310.00	1	-	-	0	-	-
2008	Other	Inactive	-	-	-	-	1.66%	-	1.46%	-	-	-	-	9,310.00	1	-	-	0	-	-
2009	Other	Inactive	1	19.80	0.96	18.85	1.91%	1.25	1.75%	0.02	0.02	0.45	0.33	9,310.00	1	4,187.76	19,453.44	464.303	3,723.46	0.92
2010	Other	Inactive	-	-	-	-	2.19%	-	2.08%	-	-	-	-	9,310.00	1	-	-	0	-	-
2011	Other	Inactive	-	-	-	-	2.48%	-	2.46%	-	-	-	-	9,310.00	1	-	-	0	-	-
2012	Other	Inactive	-	-	-	-	2.76%	-	2.88%	-	-	-	-	9,310.00	1	-	-	0	-	-
2013	Other	Inactive	-	-	-	-	2.98%	-	3.35%	-	-	-	-	9,310.00	1	-	-	0	-	-
2014	Other	Inactive	-	-	-	-	3.10%	-	3.87%	-	-	-	-	9,310.00	1	-	-	0	-	-
2015	Other	Inactive	-	-	-	-	3.09%	-	4.44%	-	-	-	-	9,310.00	1	-	-	0	-	-
2016	Other	Inactive	-	-	-	-	2.89%	-	5.16%	-	-	-	-	9,310.00	1	-	-	0	-	-
2017	Other	Inactive	-	-	-	-	2.52%	-	6.74%	-	-	-	-	9,310.00	1	-	-	0	-	-
2018	Other	Inactive	1	11.88	0.86	10.14	1.97%	1.25	9.58%	0.02	0.08	0.25	0.97	9,310.00	1	2,322.33	11,795.66	290.1922	2,032.14	0.76
2019	Other	Inactive	-	-	-	-	1.36%	-	12.95%	-	-	-	-	9,310.00	1	-	-	0	-	-
2020	Other	Inactive	-	-	-	-	0.78%	-	15.69%	-	-	-	-	9,310.00	1	-	-	0	-	-
2021	Other	Inactive	-	-	-	-	0.43%	-	16.69%	-	-	-	-	9,310.00	1	-	-	0	-	-
2022	Other	Inactive	-	-	-	-	0.08%	-	14.84%	-	-	-	-	9,310.00	1	-	-	0	-	-
2023	Other	Inactive	-	-	-	-	0.00%	-	9.03%	-	-	-	-	9,310.00	1	-	-	0	-	-

West Virginia Department of Environmental Protection Office of Special Reclam
Actuarial Reserve Study as of June 30, 2023
Land Reclamation Cost Projection - Deterministic Model

					2025																
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Permit Count (4)	Current Bonded Acres (5)	Adjusted Permit Coun (19)	Adjusted Acres (20)	Forfeiture Rate (21)	Adjustment Factor Permit Bond Size (22)	Release Rate (23)	Forfeited Permit Coun (24)	Released Permit Coun (25)	Forfeited Acres (26)	Released Acres (27)	Avg recl Cost per Acre (28)	Adjustment Factor Permit Status (29)	Gross Cost (30)	Adjustment Current Security Amount (31)	Forfeited Security Amount (32)	Net Cost (33)	Adjusted Permit Coun (34)
1965	Other	Phased Released	-	-	-	-	0.39%	-	5.34%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1966	Other	Phased Released	-	-	-	-	0.39%	-	5.34%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1967	Other	Phased Released	-	-	-	-	0.40%	-	5.45%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1968	Other	Phased Released	-	-	-	-	0.41%	-	5.56%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1969	Other	Phased Released	-	-	-	-	0.42%	-	5.68%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1970	Other	Phased Released	-	-	-	-	0.43%	-	5.79%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1971	Other	Phased Released	-	-	-	-	0.44%	-	5.91%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1972	Other	Phased Released	-	-	-	-	0.45%	-	6.03%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1973	Other	Phased Released	1	9.00	0.93	8.38	0.46%	1.25	6.15%	0.00	0.06	0.05	0.52	9,310.00	0.5	225.35	9,940.76	57.41751	167.94	0.87
1974	Other	Phased Released	-	-	-	-	0.47%	-	6.28%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1975	Other	Phased Released	-	-	-	-	0.49%	-	6.41%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1976	Other	Phased Released	2	27.88	1.86	25.84	0.50%	1.25	6.54%	0.01	0.12	0.16	1.69	9,310.00	0.5	749.63	9,936.08	61.91933	687.71	1.73
1977	Other	Phased Released	-	-	-	-	0.51%	-	6.67%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1978	Other	Phased Released	1	12.76	0.93	11.79	0.52%	1.25	6.81%	0.00	0.06	0.08	0.80	9,310.00	0.5	359.71	9,932.76	65.11363	294.59	0.86
1979	Other	Phased Released	2	58.69	1.85	54.20	0.54%	1.25	6.95%	0.01	0.13	0.36	3.77	9,310.00	0.5	1,696.47	19,862.08	133.5432	1,562.93	1.71
1980	Other	Phased Released	1	7.91	0.93	7.31	0.55%	1.25	6.95%	0.01	0.06	0.05	0.51	9,310.00	0.5	234.66	9,929.27	68.47152	166.19	0.86
1981	Other	Phased Released	4	475.54	3.71	440.63	0.57%	1.08	6.87%	0.02	0.25	2.68	30.29	9,310.00	0.5	12,476.01	203,581.98	1238.299	11,237.71	3.43
1982	Other	Phased Released	2	201.26	1.86	186.69	0.58%	1.25	6.72%	0.01	0.12	1.35	12.54	9,310.00	0.5	6,304.17	58,759.55	426.2474	5,877.92	1.72
1983	Other	Phased Released	3	158.90	2.80	148.04	0.60%	1.02	6.49%	0.02	0.18	0.90	9.61	9,310.00	0.5	4,170.13	186,936.54	1131.205	3,038.92	2.60
1984	Other	Phased Released	4	75.79	3.74	70.74	0.61%	1.25	6.21%	0.02	0.23	0.54	4.40	9,310.00	0.5	2,512.73	70,444.32	537.5514	1,975.18	3.48
1985	Other	Phased Released	1	43.00	0.94	40.28	0.63%	1.25	5.88%	0.01	0.06	0.32	2.37	9,310.00	0.5	1,467.63	17,061.93	133.5358	1,334.09	0.88
1986	Other	Phased Released	-	-	-	-	0.64%	-	5.51%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1987	Other	Phased Released	-	-	-	-	0.66%	-	5.12%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1988	Other	Phased Released	-	-	-	-	0.68%	-	4.70%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1989	Other	Phased Released	3	62.20	2.86	59.26	0.69%	1.25	4.27%	0.02	0.12	0.51	2.53	9,310.00	0.5	2,389.03	20,020.57	173.3913	2,215.64	2.72
1990	Other	Phased Released	-	-	-	-	0.71%	-	3.84%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1991	Other	Phased Released	-	-	-	-	0.73%	-	3.42%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1992	Other	Phased Released	-	-	-	-	0.75%	-	3.02%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1993	Other	Phased Released	-	-	-	-	0.77%	-	2.64%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1994	Other	Phased Released	-	-	-	-	0.79%	-	2.30%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1995	Other	Phased Released	-	-	-	-	0.81%	-	2.01%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1996	Other	Phased Released	-	-	-	-	0.83%	-	1.77%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1997	Other	Phased Released	1	31.16	0.98	30.35	0.85%	1.25	1.60%	0.01	0.02	0.32	0.49	9,310.00	0.5	1,498.45	14,367.15	152.3648	1,346.09	0.95
1998	Other	Phased Released	-	-	-	-	0.87%	-	1.50%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
1999	Other	Phased Released	1	179.00	0.98	175.29	0.89%	0.55	1.49%	0.01	0.01	0.86	2.61	9,310.00	0.5	4,005.40	248,343.40	1219.018	2,786.38	0.95
2000	Other	Phased Released	-	-	-	-	0.92%	-	1.57%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2001	Other	Phased Released	-	-	-	-	0.94%	-	1.75%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2002	Other	Phased Released	-	-	-	-	0.96%	-	2.04%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2003	Other	Phased Released	-	-	-	-	0.99%	-	2.46%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2004	Other	Phased Released	-	-	-	-	1.01%	-	3.01%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2005	Other	Phased Released	-	-	-	-	1.20%	-	3.70%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2006	Other	Phased Released	-	-	-	-	1.41%	-	4.54%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2007	Other	Phased Released	-	-	-	-	1.65%	-	5.54%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2008	Other	Phased Released	1	9.90	0.90	8.83	1.92%	1.25	6.70%	0.02	0.06	0.21	0.59	9,310.00	0.5	984.56	9,724.03	232.9275	751.64	0.82
2009	Other	Phased Released	-	-	-	-	2.21%	-	8.05%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2010	Other	Phased Released	-	-	-	-	2.53%	-	9.58%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2011	Other	Phased Released	-	-	-	-	2.87%	-	11.32%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2012	Other	Phased Released	-	-	-	-	3.19%	-	13.26%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2013	Other	Phased Released	-	-	-	-	3.45%	-	15.41%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2014	Other	Phased Released	-	-	-	-	3.59%	-	17.79%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2015	Other	Phased Released	1	115.00	0.73	82.91	3.57%	1.25	20.41%	0.03	0.15	3.70	16.92	9,310.00	0.5	17,226.04	16,098.21	718.4908	16,507.55	0.55
2016	Other	Phased Released	-	-	-	-	3.34%	-	23.72%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2017	Other	Phased Released	-	-	-	-	2.91%	-	30.99%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2018	Other	Phased Released	-	-	-	-	2.28%	-	44.09%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2019	Other	Phased Released	-	-	-	-	1.58%	-	59.57%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2020	Other	Phased Released	-	-	-	-	0.90%	-	72.17%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2021	Other	Phased Released	-	-	-	-	0.49%	-	76.77%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2022	Other	Phased Released	-	-	-	-	0.09%	-	68.27%	-	-	-	-	9,310.00	0.5	-	-	0	-	-
2023	Other	Phased Released	-	-	-	-	0.00%	-	41.52%	-	-	-	-	9,310.00	0.5	-	-	0	-	-

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model
Water Capital Total - All Mine Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	4,895,853	1,167,064	297,497	6,360,415	0	0	0	0
2025	4,675,403	1,114,218	263,118	6,052,738	0	0	0	0
2026	4,445,083	1,062,803	232,935	5,740,820	0	0	0	0
2027	4,195,293	1,012,894	206,716	5,414,903	2,447,927	583,532	148,749	3,180,207
2028	3,934,177	963,394	183,946	5,081,517	4,785,628	1,140,641	280,308	6,206,577
2029	3,679,252	915,614	164,221	4,759,086	4,560,243	1,088,510	248,027	5,896,779
2030	3,435,474	870,150	147,232	4,452,856	4,320,188	1,037,849	219,826	5,577,862
2031	3,204,306	826,947	132,426	4,163,678	6,031,824	1,469,841	287,304	7,788,969
2032	2,991,771	785,572	119,456	3,896,798	3,679,252	915,614	164,221	4,759,086
2033	2,793,757	745,988	108,019	3,647,764	3,435,474	870,150	147,232	4,452,856
2034	2,609,429	708,056	97,926	3,415,411	3,204,306	826,947	132,426	4,163,678
2035	2,446,436	671,850	88,941	3,207,227	2,991,771	785,572	119,456	3,896,798
2036	2,294,415	637,656	81,022	3,013,092	2,793,757	745,988	108,019	3,647,764
2037	2,156,189	605,320	74,131	2,835,639	2,609,429	708,056	97,926	3,415,411
2038	2,031,866	574,659	67,960	2,674,485	2,446,436	671,850	88,941	3,207,227
2039	1,916,056	545,519	62,479	2,524,055	2,294,415	637,656	81,022	3,013,092
2040	1,807,214	518,075	57,584	2,382,872	2,156,189	605,320	74,131	2,835,639
2041	1,706,526	492,846	53,390	2,252,762	2,031,866	574,659	67,960	2,674,485
2042	1,612,304	469,172	49,659	2,131,136	1,916,056	545,519	62,479	2,524,055
2043	1,525,163	447,651	46,324	2,019,137	1,807,214	518,075	57,584	2,382,872

Notes: Cols (1) - (3) from Exhibit E-99, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Cols (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model
Surface Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	2,132,553	492,809	167,542	2,792,903	0	0	0	0
2025	2,089,845	470,887	149,742	2,710,474	0	0	0	0
2026	2,033,607	448,069	133,918	2,615,594	0	0	0	0
2027	1,961,775	424,942	119,886	2,506,604	1,066,277	246,404	83,771	1,396,452
2028	1,878,422	401,315	107,372	2,387,110	2,111,199	481,848	158,642	2,751,689
2029	1,788,562	378,660	96,283	2,263,505	2,061,726	459,478	141,830	2,663,034
2030	1,695,439	357,004	86,457	2,138,900	1,997,691	436,506	126,902	2,561,099
2031	1,601,653	336,216	77,734	2,015,603	2,859,310	613,787	167,315	3,640,412
2032	1,508,967	316,425	69,999	1,895,391	1,788,562	378,660	96,283	2,263,505
2033	1,419,179	297,535	63,113	1,779,828	1,695,439	357,004	86,457	2,138,900
2034	1,333,040	279,327	57,022	1,669,389	1,601,653	336,216	77,734	2,015,603
2035	1,250,918	261,942	51,588	1,564,448	1,508,967	316,425	69,999	1,895,391
2036	1,172,191	245,645	46,823	1,464,659	1,419,179	297,535	63,113	1,779,828
2037	1,097,016	230,310	42,586	1,369,912	1,333,040	279,327	57,022	1,669,389
2038	1,025,760	215,809	38,819	1,280,387	1,250,918	261,942	51,588	1,564,448
2039	958,451	202,021	35,488	1,195,960	1,172,191	245,645	46,823	1,464,659
2040	895,041	189,001	32,530	1,116,572	1,097,016	230,310	42,586	1,369,912
2041	835,651	176,830	29,998	1,042,479	1,025,760	215,809	38,819	1,280,387
2042	779,717	165,417	27,722	972,856	958,451	202,021	35,488	1,195,960
2043	727,182	154,710	25,695	907,587	895,041	189,001	32,530	1,116,572

Notes: Cols (1) - (3) from Exhibit E-99, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Cols (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model
Underground Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	278,879	135,795	38,474	453,148	0	0	0	0
2025	267,679	129,139	34,550	431,368	0	0	0	0
2026	256,440	122,627	31,080	410,146	0	0	0	0
2027	245,164	116,255	28,053	389,472	139,439	67,897	19,237	226,574
2028	233,987	110,250	25,411	369,648	273,279	132,467	36,512	442,258
2029	223,143	104,436	23,084	350,664	262,060	125,883	32,815	420,757
2030	212,581	99,305	21,081	332,967	250,802	119,441	29,566	399,809
2031	202,415	94,558	19,313	316,286	356,569	168,378	39,438	564,384
2032	192,624	89,974	17,747	300,345	223,143	104,436	23,084	350,664
2033	183,264	85,583	16,360	285,207	212,581	99,305	21,081	332,967
2034	174,577	81,468	15,128	271,173	202,415	94,558	19,313	316,286
2035	166,362	77,583	14,023	257,969	192,624	89,974	17,747	300,345
2036	158,571	73,953	13,036	245,560	183,264	85,583	16,360	285,207
2037	151,208	70,582	12,147	233,937	174,577	81,468	15,128	271,173
2038	144,334	67,432	11,345	223,111	166,362	77,583	14,023	257,969
2039	137,896	64,484	10,639	213,019	158,571	73,953	13,036	245,560
2040	131,856	61,747	10,019	203,622	151,208	70,582	12,147	233,937
2041	126,257	59,286	9,464	195,006	144,334	67,432	11,345	223,111
2042	120,984	57,039	8,985	187,008	137,896	64,484	10,639	213,019
2043	116,708	54,972	8,556	180,236	131,856	61,747	10,019	203,622

Notes: Cols (1) - (3) from Exhibit E-99, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Cols (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model
Other

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Gross Liability				Gross Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	2,484,421	538,461	91,481	3,114,364	0	0	0	0
2025	2,317,879	514,192	78,826	2,910,897	0	0	0	0
2026	2,155,036	492,107	67,938	2,715,080	0	0	0	0
2027	1,988,353	471,697	58,777	2,518,827	1,242,211	269,230	45,741	1,557,182
2028	1,821,768	451,829	51,163	2,324,760	2,401,150	526,326	85,154	3,012,630
2029	1,667,546	432,518	44,853	2,144,917	2,236,457	503,149	73,382	2,812,988
2030	1,527,453	413,841	39,695	1,980,990	2,071,694	481,902	63,357	2,616,953
2031	1,400,238	396,173	35,378	1,831,789	2,815,945	687,677	80,551	3,584,173
2032	1,290,181	379,172	31,710	1,701,063	1,667,546	432,518	44,853	2,144,917
2033	1,191,314	362,870	28,546	1,582,729	1,527,453	413,841	39,695	1,980,990
2034	1,101,812	347,260	25,777	1,474,849	1,400,238	396,173	35,378	1,831,789
2035	1,029,156	332,325	23,330	1,384,810	1,290,181	379,172	31,710	1,701,063
2036	963,653	318,058	21,162	1,302,873	1,191,314	362,870	28,546	1,582,729
2037	907,965	304,428	19,398	1,231,791	1,101,812	347,260	25,777	1,474,849
2038	861,772	291,418	17,796	1,170,986	1,029,156	332,325	23,330	1,384,810
2039	819,709	279,014	16,352	1,115,076	963,653	318,058	21,162	1,302,873
2040	780,317	267,326	15,035	1,062,678	907,965	304,428	19,398	1,231,791
2041	744,618	256,730	13,929	1,015,277	861,772	291,418	17,796	1,170,986
2042	711,603	246,716	12,952	971,271	819,709	279,014	16,352	1,115,076
2043	681,272	237,969	12,072	931,314	780,317	267,326	15,035	1,062,678

Notes: Cols (1) - (3) from Exhibit E-99, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Cols (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Surface	Active	-	0.060%	0.00	0.821%	-	-	3,030.00	1.00	-
1966	Surface	Active	-	0.064%	0.00	0.855%	-	-	3,030.00	1.00	-
1967	Surface	Active	-	0.067%	0.00	0.891%	-	-	3,030.00	1.00	-
1968	Surface	Active	-	0.070%	0.00	0.928%	-	-	3,030.00	1.00	-
1969	Surface	Active	-	0.074%	0.00	0.967%	-	-	3,030.00	1.00	-
1970	Surface	Active	-	0.078%	0.00	1.007%	-	-	3,030.00	1.00	-
1971	Surface	Active	-	0.082%	0.00	1.049%	-	-	3,030.00	1.00	-
1972	Surface	Active	400.00	0.086%	1.25	1.092%	0.43	4.37	3,030.00	1.00	1,309.42
1973	Surface	Active	-	0.091%	0.00	1.138%	-	-	3,030.00	1.00	-
1974	Surface	Active	-	0.096%	0.00	1.185%	-	-	3,030.00	1.00	-
1975	Surface	Active	-	0.101%	0.00	1.235%	-	-	3,030.00	1.00	-
1976	Surface	Active	-	0.106%	0.00	1.286%	-	-	3,030.00	1.00	-
1977	Surface	Active	1,504.07	0.112%	1.02	1.340%	1.71	20.15	3,030.00	1.00	5,175.34
1978	Surface	Active	2,061.88	0.118%	0.90	1.396%	2.18	28.78	3,030.00	1.00	6,611.12
1979	Surface	Active	180.00	0.124%	0.90	1.454%	0.20	2.62	3,030.00	1.00	607.52
1980	Surface	Active	475.70	0.130%	0.90	1.552%	0.56	7.38	3,030.00	1.00	1,690.04
1981	Surface	Active	1,999.30	0.137%	0.94	1.644%	2.59	32.86	3,030.00	1.00	7,840.30
1982	Surface	Active	216.78	0.144%	0.90	1.729%	0.28	3.75	3,030.00	1.00	853.37
1983	Surface	Active	1,708.57	0.152%	0.90	1.809%	2.34	30.91	3,030.00	1.00	7,079.88
1984	Surface	Active	-	0.160%	0.00	1.883%	-	-	3,030.00	1.00	-
1985	Surface	Active	2,501.65	0.168%	0.76	1.950%	3.20	48.79	3,030.00	1.00	9,699.37
1986	Surface	Active	2,503.23	0.177%	0.99	2.012%	4.38	50.36	3,030.00	1.00	13,274.49
1987	Surface	Active	1,371.12	0.187%	1.02	2.067%	2.60	28.35	3,030.00	1.00	7,879.71
1988	Surface	Active	1,677.10	0.196%	0.86	2.117%	2.82	35.51	3,030.00	1.00	8,544.61
1989	Surface	Active	2,103.52	0.207%	0.90	2.161%	3.91	45.46	3,030.00	1.00	11,857.64
1990	Surface	Active	2,621.86	0.218%	0.84	2.199%	4.77	57.66	3,030.00	1.00	14,457.40
1991	Surface	Active	2,000.59	0.229%	0.98	2.232%	4.48	44.65	3,030.00	1.00	13,575.64
1992	Surface	Active	4,639.40	0.241%	0.90	2.259%	10.07	104.78	3,030.00	1.00	30,503.01
1993	Surface	Active	4,377.78	0.254%	0.90	2.280%	10.00	99.80	3,030.00	1.00	30,297.81
1994	Surface	Active	1,898.65	0.267%	0.75	2.295%	3.80	43.58	3,030.00	1.00	11,526.50
1995	Surface	Active	7,733.29	0.281%	0.96	2.305%	20.84	178.26	3,030.00	1.00	63,146.38
1996	Surface	Active	6,830.47	0.296%	0.99	2.309%	19.97	157.75	3,030.00	1.00	60,496.69
1997	Surface	Active	11,904.74	0.312%	0.96	2.308%	35.55	274.81	3,030.00	1.00	107,710.20
1998	Surface	Active	11,419.01	0.328%	0.87	2.302%	32.40	262.86	3,030.00	1.00	98,161.52
1999	Surface	Active	2,008.81	0.345%	0.81	2.290%	5.63	46.01	3,030.00	1.00	17,074.00
2000	Surface	Active	4,046.61	0.363%	0.84	2.273%	12.38	91.98	3,030.00	1.00	37,504.29
2001	Surface	Active	7,748.62	0.383%	0.93	2.251%	27.67	174.39	3,030.00	1.00	83,827.60
2002	Surface	Active	6,126.39	0.397%	0.93	2.223%	22.49	136.18	3,030.00	1.00	68,145.52
2003	Surface	Active	9,797.63	0.411%	0.92	2.190%	36.96	214.57	3,030.00	1.00	111,994.74
2004	Surface	Active	12,659.51	0.424%	0.93	2.152%	49.96	272.44	3,030.00	1.00	151,389.11
2005	Surface	Active	4,606.35	0.437%	1.04	2.109%	20.94	97.15	3,030.00	1.00	63,442.71
2006	Surface	Active	5,201.55	0.449%	0.96	2.061%	22.52	107.19	3,030.00	1.00	68,250.31
2007	Surface	Active	5,703.65	0.461%	0.93	2.008%	24.47	114.51	3,030.00	1.00	74,140.03
2008	Surface	Active	9,829.70	0.472%	0.86	1.950%	39.85	191.63	3,030.00	1.00	120,758.62
2009	Surface	Active	6,204.14	0.482%	0.88	1.887%	26.28	117.04	3,030.00	1.00	79,632.29
2010	Surface	Active	4,481.21	0.492%	1.00	1.819%	21.94	81.50	3,030.00	1.00	66,492.34
2011	Surface	Active	2,487.54	0.501%	0.85	1.746%	10.63	43.43	3,030.00	1.00	32,201.69
2012	Surface	Active	8,236.40	0.509%	0.92	1.668%	38.33	137.42	3,030.00	1.00	116,150.09
2013	Surface	Active	8,588.04	0.515%	0.96	1.586%	42.66	136.22	3,030.00	1.00	129,259.86
2014	Surface	Active	6,755.47	0.521%	0.83	1.499%	29.11	101.28	3,030.00	1.00	88,202.54
2015	Surface	Active	3,846.62	0.525%	0.90	1.412%	18.19	54.32	3,030.00	1.00	55,118.83
2016	Surface	Active	3,384.53	0.524%	0.86	1.309%	15.27	44.30	3,030.00	1.00	46,268.37
2017	Surface	Active	1,137.87	0.512%	1.08	1.189%	6.26	13.53	3,030.00	1.00	18,970.72
2018	Surface	Active	3,687.08	0.484%	1.03	1.046%	18.42	38.55	3,030.00	1.00	55,805.17
2019	Surface	Active	4,472.27	0.437%	0.94	0.873%	18.43	39.06	3,030.00	1.00	55,854.93
2020	Surface	Active	3,978.72	0.364%	0.74	0.666%	10.74	26.51	3,030.00	1.00	32,528.28
2021	Surface	Active	3,857.52	0.262%	0.85	0.418%	8.59	16.12	3,030.00	1.00	26,016.20
2022	Surface	Active	5,387.71	0.125%	1.04	0.122%	7.01	6.60	3,030.00	1.00	21,226.77
2023	Surface	Active	3,969.18	0.000%	0.99	0.000%	(0.00)	0.00	3,030.00	1.00	(0.00)

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				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Surface	Inactive	-	0.138%	0.00	0.483%	-	-	3,030.00	1.00	-
1966	Surface	Inactive	-	0.145%	0.00	0.503%	-	-	3,030.00	1.00	-
1967	Surface	Inactive	-	0.153%	0.00	0.524%	-	-	3,030.00	1.00	-
1968	Surface	Inactive	-	0.161%	0.00	0.546%	-	-	3,030.00	1.00	-
1969	Surface	Inactive	-	0.169%	0.00	0.569%	-	-	3,030.00	1.00	-
1970	Surface	Inactive	-	0.178%	0.00	0.592%	-	-	3,030.00	1.00	-
1971	Surface	Inactive	-	0.188%	0.00	0.617%	-	-	3,030.00	1.00	-
1972	Surface	Inactive	-	0.198%	0.00	0.643%	-	-	3,030.00	1.00	-
1973	Surface	Inactive	-	0.208%	0.00	0.669%	-	-	3,030.00	1.00	-
1974	Surface	Inactive	-	0.219%	0.00	0.697%	-	-	3,030.00	1.00	-
1975	Surface	Inactive	-	0.230%	0.00	0.726%	-	-	3,030.00	1.00	-
1976	Surface	Inactive	438.80	0.243%	0.55	0.757%	0.59	3.32	3,030.00	1.00	1,773.65
1977	Surface	Inactive	-	0.255%	0.00	0.788%	-	-	3,030.00	1.00	-
1978	Surface	Inactive	-	0.269%	0.00	0.821%	-	-	3,030.00	1.00	-
1979	Surface	Inactive	-	0.283%	0.00	0.855%	-	-	3,030.00	1.00	-
1980	Surface	Inactive	-	0.298%	0.00	0.913%	-	-	3,030.00	1.00	-
1981	Surface	Inactive	-	0.313%	0.00	0.967%	-	-	3,030.00	1.00	-
1982	Surface	Inactive	-	0.330%	0.00	1.017%	-	-	3,030.00	1.00	-
1983	Surface	Inactive	-	0.347%	0.00	1.064%	-	-	3,030.00	1.00	-
1984	Surface	Inactive	-	0.366%	0.00	1.107%	-	-	3,030.00	1.00	-
1985	Surface	Inactive	-	0.385%	0.00	1.147%	-	-	3,030.00	1.00	-
1986	Surface	Inactive	411.07	0.405%	0.90	1.183%	1.50	4.86	3,030.00	1.00	4,541.09
1987	Surface	Inactive	415.61	0.426%	1.08	1.216%	1.91	5.05	3,030.00	1.00	5,772.62
1988	Surface	Inactive	1,304.38	0.449%	0.90	1.245%	5.27	16.25	3,030.00	1.00	15,966.19
1989	Surface	Inactive	176.00	0.472%	0.90	1.271%	0.75	2.24	3,030.00	1.00	2,267.70
1990	Surface	Inactive	70.12	0.497%	0.55	1.294%	0.19	0.91	3,030.00	1.00	581.18
1991	Surface	Inactive	-	0.524%	0.00	1.313%	-	-	3,030.00	1.00	-
1992	Surface	Inactive	-	0.551%	0.00	1.329%	-	-	3,030.00	1.00	-
1993	Surface	Inactive	-	0.580%	0.00	1.341%	-	-	3,030.00	1.00	-
1994	Surface	Inactive	-	0.611%	0.00	1.350%	-	-	3,030.00	1.00	-
1995	Surface	Inactive	2,098.71	0.643%	0.90	1.356%	12.14	28.46	3,030.00	1.00	36,786.16
1996	Surface	Inactive	-	0.677%	0.00	1.359%	-	-	3,030.00	1.00	-
1997	Surface	Inactive	-	0.712%	0.00	1.358%	-	-	3,030.00	1.00	-
1998	Surface	Inactive	846.89	0.750%	0.90	1.354%	5.71	11.47	3,030.00	1.00	17,313.63
1999	Surface	Inactive	1,733.11	0.789%	1.25	1.347%	17.10	23.35	3,030.00	1.00	51,800.17
2000	Surface	Inactive	-	0.831%	0.00	1.337%	-	-	3,030.00	1.00	-
2001	Surface	Inactive	-	0.874%	0.00	1.324%	-	-	3,030.00	1.00	-
2002	Surface	Inactive	1,146.85	0.907%	0.78	1.308%	8.15	15.00	3,030.00	1.00	24,692.56
2003	Surface	Inactive	1,161.50	0.939%	0.90	1.288%	9.81	14.96	3,030.00	1.00	29,738.46
2004	Surface	Inactive	3,700.97	0.970%	0.90	1.266%	32.29	46.85	3,030.00	1.00	97,852.47
2005	Surface	Inactive	-	0.999%	0.00	1.241%	-	-	3,030.00	1.00	-
2006	Surface	Inactive	244.59	1.027%	0.55	1.212%	1.38	2.97	3,030.00	1.00	4,186.80
2007	Surface	Inactive	1,080.24	1.054%	0.55	1.181%	6.26	12.76	3,030.00	1.00	18,972.25
2008	Surface	Inactive	118.60	1.079%	1.25	1.147%	1.60	1.36	3,030.00	1.00	4,847.20
2009	Surface	Inactive	680.43	1.103%	0.55	1.110%	4.13	7.55	3,030.00	1.00	12,503.15
2010	Surface	Inactive	1,146.11	1.124%	1.08	1.070%	13.85	12.26	3,030.00	1.00	41,977.02
2011	Surface	Inactive	1,088.67	1.144%	0.78	1.027%	9.76	11.18	3,030.00	1.00	29,570.23
2012	Surface	Inactive	-	1.162%	0.00	0.981%	-	-	3,030.00	1.00	-
2013	Surface	Inactive	93.44	1.178%	0.55	0.933%	0.61	0.87	3,030.00	1.00	1,834.74
2014	Surface	Inactive	415.42	1.192%	0.90	0.882%	4.46	3.66	3,030.00	1.00	13,503.03
2015	Surface	Inactive	1,156.30	1.201%	0.67	0.831%	9.26	9.61	3,030.00	1.00	28,053.00
2016	Surface	Inactive	776.75	1.198%	0.73	0.770%	6.74	5.98	3,030.00	1.00	20,434.68
2017	Surface	Inactive	154.63	1.170%	0.90	0.699%	1.63	1.08	3,030.00	1.00	4,933.34
2018	Surface	Inactive	351.08	1.107%	0.90	0.615%	3.50	2.16	3,030.00	1.00	10,599.82
2019	Surface	Inactive	452.10	0.998%	0.90	0.514%	4.06	2.32	3,030.00	1.00	12,307.66
2020	Surface	Inactive	-	0.832%	0.00	0.392%	-	-	3,030.00	1.00	-
2021	Surface	Inactive	-	0.599%	0.00	0.246%	-	-	3,030.00	1.00	-
2022	Surface	Inactive	-	0.286%	0.00	0.072%	-	-	3,030.00	1.00	-
2023	Surface	Inactive	-	0.000%	0.00	0.000%	-	-	3,030.00	1.00	-

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				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Surface	Phased Released	-	0.160%	0.00	2.221%	-	-	3,030.00	0.50	-
1966	Surface	Phased Released	-	0.168%	0.00	2.314%	-	-	3,030.00	0.50	-
1967	Surface	Phased Released	-	0.177%	0.00	2.410%	-	-	3,030.00	0.50	-
1968	Surface	Phased Released	-	0.186%	0.00	2.511%	-	-	3,030.00	0.50	-
1969	Surface	Phased Released	-	0.196%	0.00	2.615%	-	-	3,030.00	0.50	-
1970	Surface	Phased Released	-	0.206%	0.00	2.724%	-	-	3,030.00	0.50	-
1971	Surface	Phased Released	-	0.217%	0.00	2.838%	-	-	3,030.00	0.50	-
1972	Surface	Phased Released	-	0.228%	0.00	2.956%	-	-	3,030.00	0.50	-
1973	Surface	Phased Released	-	0.240%	0.00	3.079%	-	-	3,030.00	0.50	-
1974	Surface	Phased Released	189.60	0.253%	1.25	3.208%	0.60	6.08	3,030.00	0.50	908.77
1975	Surface	Phased Released	7.80	0.266%	1.25	3.341%	0.03	0.26	3,030.00	0.50	39.35
1976	Surface	Phased Released	626.17	0.280%	1.25	3.480%	2.20	21.79	3,030.00	0.50	3,325.54
1977	Surface	Phased Released	48.00	0.295%	1.25	3.625%	0.18	1.74	3,030.00	0.50	268.34
1978	Surface	Phased Released	158.81	0.311%	1.25	3.777%	0.62	6.00	3,030.00	0.50	934.55
1979	Surface	Phased Released	358.00	0.327%	1.25	3.934%	1.46	14.08	3,030.00	0.50	2,217.59
1980	Surface	Phased Released	253.42	0.344%	1.25	4.199%	1.09	10.64	3,030.00	0.50	1,652.40
1981	Surface	Phased Released	1,785.41	0.362%	1.00	4.448%	6.47	79.41	3,030.00	0.50	9,803.47
1982	Surface	Phased Released	-	0.382%	0.00	4.680%	-	-	3,030.00	0.50	-
1983	Surface	Phased Released	302.61	0.402%	1.25	4.895%	1.52	14.81	3,030.00	0.50	2,301.38
1984	Surface	Phased Released	2,585.75	0.423%	1.08	5.094%	11.75	131.72	3,030.00	0.50	17,801.88
1985	Surface	Phased Released	1,270.29	0.445%	0.90	5.277%	5.09	67.03	3,030.00	0.50	7,707.13
1986	Surface	Phased Released	1,041.15	0.468%	0.90	5.444%	4.39	56.68	3,030.00	0.50	6,649.35
1987	Surface	Phased Released	760.81	0.493%	0.90	5.594%	3.38	42.56	3,030.00	0.50	5,114.68
1988	Surface	Phased Released	478.00	0.519%	1.25	5.729%	3.10	27.38	3,030.00	0.50	4,698.01
1989	Surface	Phased Released	1,098.64	0.546%	1.11	5.848%	6.66	64.25	3,030.00	0.50	10,093.26
1990	Surface	Phased Released	764.18	0.575%	1.25	5.951%	5.49	45.48	3,030.00	0.50	8,322.14
1991	Surface	Phased Released	1,006.45	0.605%	0.97	6.039%	5.91	60.78	3,030.00	0.50	8,953.02
1992	Surface	Phased Released	-	0.637%	0.00	6.111%	-	-	3,030.00	0.50	-
1993	Surface	Phased Released	562.59	0.671%	1.25	6.168%	4.72	34.70	3,030.00	0.50	7,145.96
1994	Surface	Phased Released	386.03	0.706%	0.90	6.210%	2.45	23.97	3,030.00	0.50	3,716.19
1995	Surface	Phased Released	484.30	0.743%	1.13	6.237%	4.08	30.21	3,030.00	0.50	6,179.93
1996	Surface	Phased Released	675.12	0.782%	0.90	6.249%	4.75	42.19	3,030.00	0.50	7,201.30
1997	Surface	Phased Released	969.50	0.823%	1.08	6.246%	8.58	60.56	3,030.00	0.50	13,002.30
1998	Surface	Phased Released	511.73	0.867%	0.78	6.229%	3.47	31.88	3,030.00	0.50	5,264.15
1999	Surface	Phased Released	14.87	0.912%	1.25	6.197%	0.17	0.92	3,030.00	0.50	256.94
2000	Surface	Phased Released	19.70	0.960%	1.25	6.151%	0.24	1.21	3,030.00	0.50	358.32
2001	Surface	Phased Released	491.55	1.011%	1.02	6.090%	5.05	29.93	3,030.00	0.50	7,654.48
2002	Surface	Phased Released	154.49	1.049%	1.25	6.015%	2.03	9.29	3,030.00	0.50	3,068.63
2003	Surface	Phased Released	-	1.086%	1.25	5.926%	-	-	3,030.00	0.50	-
2004	Surface	Phased Released	470.13	1.121%	1.08	5.823%	5.67	27.38	3,030.00	0.50	8,583.45
2005	Surface	Phased Released	51.50	1.155%	1.25	5.707%	0.74	2.94	3,030.00	0.50	1,126.55
2006	Surface	Phased Released	60.78	1.188%	1.25	5.576%	0.90	3.39	3,030.00	0.50	1,367.01
2007	Surface	Phased Released	186.68	1.219%	0.55	5.433%	1.25	10.14	3,030.00	0.50	1,895.48
2008	Surface	Phased Released	-	1.248%	0.00	5.275%	-	-	3,030.00	0.50	-
2009	Surface	Phased Released	220.84	1.275%	0.90	5.105%	2.53	11.27	3,030.00	0.50	3,838.97
2010	Surface	Phased Released	-	1.300%	0.00	4.921%	-	-	3,030.00	0.50	-
2011	Surface	Phased Released	214.01	1.323%	1.25	4.724%	3.54	10.11	3,030.00	0.50	5,362.63
2012	Surface	Phased Released	-	1.344%	0.00	4.514%	-	-	3,030.00	0.50	-
2013	Surface	Phased Released	-	1.362%	0.00	4.292%	-	-	3,030.00	0.50	-
2014	Surface	Phased Released	27.91	1.378%	1.25	4.057%	0.48	1.13	3,030.00	0.50	728.44
2015	Surface	Phased Released	-	1.389%	0.00	3.821%	-	-	3,030.00	0.50	-
2016	Surface	Phased Released	-	1.385%	0.00	3.542%	-	-	3,030.00	0.50	-
2017	Surface	Phased Released	-	1.353%	0.00	3.216%	-	-	3,030.00	0.50	-
2018	Surface	Phased Released	-	1.280%	0.00	2.829%	-	-	3,030.00	0.50	-
2019	Surface	Phased Released	-	1.154%	0.00	2.363%	-	-	3,030.00	0.50	-
2020	Surface	Phased Released	-	0.962%	0.00	1.803%	-	-	3,030.00	0.50	-
2021	Surface	Phased Released	-	0.692%	0.00	1.131%	-	-	3,030.00	0.50	-
2022	Surface	Phased Released	-	0.330%	0.00	0.331%	-	-	3,030.00	0.50	-
2023	Surface	Phased Released	-	0.000%	0.00	0.000%	-	-	3,030.00	0.50	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Underground	Active	-	0.101%	0.00	0.594%	-	-	5,165.00	1.00	-
1966	Underground	Active	-	0.104%	0.00	0.619%	-	-	5,165.00	1.00	-
1967	Underground	Active	-	0.107%	0.00	0.645%	-	-	5,165.00	1.00	-
1968	Underground	Active	-	0.109%	0.00	0.672%	-	-	5,165.00	1.00	-
1969	Underground	Active	-	0.112%	0.00	0.700%	-	-	5,165.00	1.00	-
1970	Underground	Active	-	0.115%	0.00	0.729%	-	-	5,165.00	1.00	-
1971	Underground	Active	-	0.118%	0.00	0.759%	-	-	5,165.00	1.00	-
1972	Underground	Active	-	0.121%	0.00	0.791%	-	-	5,165.00	1.00	-
1973	Underground	Active	-	0.124%	0.00	0.824%	-	-	5,165.00	1.00	-
1974	Underground	Active	-	0.127%	0.00	0.858%	-	-	5,165.00	1.00	-
1975	Underground	Active	-	0.131%	0.00	0.894%	-	-	5,165.00	1.00	-
1976	Underground	Active	-	0.134%	0.00	0.931%	-	-	5,165.00	1.00	-
1977	Underground	Active	-	0.137%	0.00	0.970%	-	-	5,165.00	1.00	-
1978	Underground	Active	-	0.141%	0.00	1.076%	-	-	5,165.00	1.00	-
1979	Underground	Active	755.59	0.145%	1.03	1.183%	1.13	8.94	5,165.00	1.00	5,817.12
1980	Underground	Active	222.16	0.148%	0.97	1.290%	0.32	2.87	5,165.00	1.00	1,650.03
1981	Underground	Active	720.89	0.152%	1.17	1.397%	1.28	10.07	5,165.00	1.00	6,610.42
1982	Underground	Active	80.68	0.156%	1.02	1.503%	0.13	1.21	5,165.00	1.00	660.68
1983	Underground	Active	7,126.06	0.160%	0.91	1.609%	10.40	114.64	5,165.00	1.00	53,692.82
1984	Underground	Active	2,930.46	0.164%	1.02	1.713%	4.92	50.19	5,165.00	1.00	25,413.86
1985	Underground	Active	49.00	0.168%	1.25	1.815%	0.10	0.89	5,165.00	1.00	532.27
1986	Underground	Active	252.11	0.173%	1.11	1.915%	0.48	4.83	5,165.00	1.00	2,494.24
1987	Underground	Active	203.45	0.177%	1.11	2.013%	0.40	4.10	5,165.00	1.00	2,064.44
1988	Underground	Active	179.01	0.182%	1.11	2.108%	0.36	3.77	5,165.00	1.00	1,863.01
1989	Underground	Active	124.25	0.186%	1.25	2.199%	0.29	2.73	5,165.00	1.00	1,493.54
1990	Underground	Active	131.40	0.191%	1.08	2.287%	0.27	3.01	5,165.00	1.00	1,393.19
1991	Underground	Active	35.30	0.196%	1.25	2.370%	0.09	0.84	5,165.00	1.00	446.36
1992	Underground	Active	1,073.06	0.201%	0.96	2.449%	2.07	26.28	5,165.00	1.00	10,669.35
1993	Underground	Active	974.28	0.206%	1.02	2.523%	2.04	24.58	5,165.00	1.00	10,540.36
1994	Underground	Active	756.33	0.211%	0.99	2.592%	1.58	19.60	5,165.00	1.00	8,151.49
1995	Underground	Active	273.19	0.224%	1.02	2.655%	0.62	7.25	5,165.00	1.00	3,213.54
1996	Underground	Active	242.74	0.237%	1.04	2.711%	0.60	6.58	5,165.00	1.00	3,084.33
1997	Underground	Active	239.17	0.249%	1.09	2.761%	0.65	6.60	5,165.00	1.00	3,346.13
1998	Underground	Active	558.33	0.261%	0.99	2.804%	1.44	15.66	5,165.00	1.00	7,429.60
1999	Underground	Active	117.00	0.273%	1.25	2.840%	0.40	3.32	5,165.00	1.00	2,059.19
2000	Underground	Active	281.79	0.284%	1.08	2.868%	0.86	8.08	5,165.00	1.00	4,442.31
2001	Underground	Active	224.71	0.295%	0.83	2.887%	0.55	6.49	5,165.00	1.00	2,839.96
2002	Underground	Active	265.26	0.305%	1.16	2.898%	0.94	7.69	5,165.00	1.00	4,860.95
2003	Underground	Active	998.12	0.315%	1.15	2.900%	3.63	28.95	5,165.00	1.00	18,751.56
2004	Underground	Active	460.97	0.324%	1.00	2.893%	1.49	13.33	5,165.00	1.00	7,721.03
2005	Underground	Active	325.84	0.333%	0.95	2.875%	1.03	9.37	5,165.00	1.00	5,322.09
2006	Underground	Active	433.77	0.341%	0.83	2.848%	1.23	12.35	5,165.00	1.00	6,336.54
2007	Underground	Active	594.07	0.348%	1.10	2.810%	2.28	16.69	5,165.00	1.00	11,785.87
2008	Underground	Active	107.24	0.354%	1.25	2.760%	0.47	2.96	5,165.00	1.00	2,452.16
2009	Underground	Active	344.39	0.360%	0.90	2.700%	1.11	9.30	5,165.00	1.00	5,756.75
2010	Underground	Active	241.30	0.364%	1.16	2.627%	1.02	6.34	5,165.00	1.00	5,275.16
2011	Underground	Active	201.31	0.368%	1.15	2.543%	0.85	5.12	5,165.00	1.00	4,395.68
2012	Underground	Active	220.12	0.370%	1.05	2.445%	0.86	5.38	5,165.00	1.00	4,418.12
2013	Underground	Active	495.72	0.371%	1.03	2.335%	1.89	11.57	5,165.00	1.00	9,749.54
2014	Underground	Active	752.00	0.372%	1.06	2.211%	2.96	16.63	5,165.00	1.00	15,292.24
2015	Underground	Active	157.00	0.369%	1.15	2.073%	0.67	3.25	5,165.00	1.00	3,439.61
2016	Underground	Active	135.36	0.364%	1.25	1.921%	0.62	2.60	5,165.00	1.00	3,177.65
2017	Underground	Active	161.03	0.351%	1.25	1.754%	0.71	2.82	5,165.00	1.00	3,651.39
2018	Underground	Active	52.55	0.329%	1.25	1.572%	0.22	0.83	5,165.00	1.00	1,115.20
2019	Underground	Active	149.13	0.293%	1.08	1.375%	0.47	2.05	5,165.00	1.00	2,427.01
2020	Underground	Active	126.64	0.241%	1.25	1.162%	0.38	1.47	5,165.00	1.00	1,974.43
2021	Underground	Active	76.97	0.171%	1.25	0.932%	0.16	0.72	5,165.00	1.00	849.12
2022	Underground	Active	43.22	0.078%	1.25	0.686%	0.04	0.30	5,165.00	1.00	218.52
2023	Underground	Active	69.14	0.000%	1.25	0.423%	(0.00)	0.29	5,165.00	1.00	(0.00)

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Underground	Inactive	-	0.232%	0.00	0.350%	-	-	5,165.00	1.00	-
1966	Underground	Inactive	-	0.238%	0.00	0.364%	-	-	5,165.00	1.00	-
1967	Underground	Inactive	-	0.244%	0.00	0.379%	-	-	5,165.00	1.00	-
1968	Underground	Inactive	-	0.250%	0.00	0.395%	-	-	5,165.00	1.00	-
1969	Underground	Inactive	-	0.256%	0.00	0.412%	-	-	5,165.00	1.00	-
1970	Underground	Inactive	-	0.263%	0.00	0.429%	-	-	5,165.00	1.00	-
1971	Underground	Inactive	-	0.270%	0.00	0.447%	-	-	5,165.00	1.00	-
1972	Underground	Inactive	-	0.277%	0.00	0.465%	-	-	5,165.00	1.00	-
1973	Underground	Inactive	-	0.284%	0.00	0.485%	-	-	5,165.00	1.00	-
1974	Underground	Inactive	-	0.291%	0.00	0.505%	-	-	5,165.00	1.00	-
1975	Underground	Inactive	-	0.299%	0.00	0.526%	-	-	5,165.00	1.00	-
1976	Underground	Inactive	26.50	0.306%	0.55	0.548%	0.04	0.15	5,165.00	1.00	230.52
1977	Underground	Inactive	-	0.314%	0.00	0.571%	-	-	5,165.00	1.00	-
1978	Underground	Inactive	117.89	0.322%	0.55	0.633%	0.21	0.75	5,165.00	1.00	1,078.76
1979	Underground	Inactive	-	0.330%	0.00	0.696%	-	-	5,165.00	1.00	-
1980	Underground	Inactive	-	0.339%	0.00	0.759%	-	-	5,165.00	1.00	-
1981	Underground	Inactive	189.58	0.348%	0.73	0.822%	0.48	1.56	5,165.00	1.00	2,467.18
1982	Underground	Inactive	72.51	0.356%	0.55	0.884%	0.14	0.64	5,165.00	1.00	734.22
1983	Underground	Inactive	285.25	0.366%	0.78	0.946%	0.82	2.70	5,165.00	1.00	4,219.23
1984	Underground	Inactive	-	0.375%	0.00	1.008%	-	-	5,165.00	1.00	-
1985	Underground	Inactive	220.21	0.385%	0.90	1.068%	0.76	2.35	5,165.00	1.00	3,936.69
1986	Underground	Inactive	43.54	0.394%	0.55	1.127%	0.09	0.49	5,165.00	1.00	487.86
1987	Underground	Inactive	40.89	0.405%	0.55	1.184%	0.09	0.48	5,165.00	1.00	469.92
1988	Underground	Inactive	73.42	0.415%	1.19	1.240%	0.36	0.91	5,165.00	1.00	1,875.03
1989	Underground	Inactive	193.50	0.426%	0.55	1.294%	0.45	2.50	5,165.00	1.00	2,339.25
1990	Underground	Inactive	47.64	0.436%	1.08	1.345%	0.22	0.64	5,165.00	1.00	1,154.54
1991	Underground	Inactive	362.42	0.448%	1.02	1.394%	1.65	5.05	5,165.00	1.00	8,519.51
1992	Underground	Inactive	9.00	0.459%	1.25	1.441%	0.05	0.13	5,165.00	1.00	266.79
1993	Underground	Inactive	35.86	0.471%	0.90	1.484%	0.15	0.53	5,165.00	1.00	785.00
1994	Underground	Inactive	100.78	0.483%	0.55	1.525%	0.27	1.54	5,165.00	1.00	1,382.76
1995	Underground	Inactive	182.46	0.512%	0.67	1.561%	0.62	2.85	5,165.00	1.00	3,216.91
1996	Underground	Inactive	55.21	0.541%	1.25	1.595%	0.37	0.88	5,165.00	1.00	1,927.24
1997	Underground	Inactive	282.76	0.569%	1.02	1.624%	1.64	4.59	5,165.00	1.00	8,445.82
1998	Underground	Inactive	72.14	0.596%	0.90	1.649%	0.39	1.19	5,165.00	1.00	1,999.76
1999	Underground	Inactive	606.66	0.623%	1.11	1.670%	4.20	10.13	5,165.00	1.00	21,671.59
2000	Underground	Inactive	256.24	0.649%	1.16	1.687%	1.93	4.32	5,165.00	1.00	9,984.73
2001	Underground	Inactive	6.00	0.674%	1.25	1.698%	0.05	0.10	5,165.00	1.00	261.03
2002	Underground	Inactive	47.21	0.698%	0.90	1.705%	0.30	0.80	5,165.00	1.00	1,530.93
2003	Underground	Inactive	212.02	0.720%	0.76	1.706%	1.16	3.62	5,165.00	1.00	5,993.16
2004	Underground	Inactive	180.23	0.741%	0.55	1.702%	0.73	3.07	5,165.00	1.00	3,795.02
2005	Underground	Inactive	124.90	0.761%	1.11	1.691%	1.05	2.11	5,165.00	1.00	5,448.31
2006	Underground	Inactive	160.75	0.779%	1.02	1.675%	1.27	2.69	5,165.00	1.00	6,574.55
2007	Underground	Inactive	107.80	0.795%	0.78	1.653%	0.67	1.78	5,165.00	1.00	3,467.98
2008	Underground	Inactive	79.05	0.810%	1.25	1.624%	0.80	1.28	5,165.00	1.00	4,131.57
2009	Underground	Inactive	111.36	0.822%	1.15	1.588%	1.05	1.77	5,165.00	1.00	5,436.67
2010	Underground	Inactive	161.54	0.832%	1.17	1.545%	1.58	2.50	5,165.00	1.00	8,139.48
2011	Underground	Inactive	129.26	0.840%	1.15	1.496%	1.25	1.93	5,165.00	1.00	6,451.29
2012	Underground	Inactive	32.84	0.846%	0.55	1.438%	0.15	0.47	5,165.00	1.00	789.18
2013	Underground	Inactive	44.71	0.849%	1.25	1.373%	0.47	0.61	5,165.00	1.00	2,451.10
2014	Underground	Inactive	12.00	0.850%	1.25	1.300%	0.13	0.16	5,165.00	1.00	658.31
2015	Underground	Inactive	16.83	0.843%	1.25	1.219%	0.18	0.21	5,165.00	1.00	916.07
2016	Underground	Inactive	13.42	0.831%	1.25	1.130%	0.14	0.15	5,165.00	1.00	720.10
2017	Underground	Inactive	-	0.803%	0.00	1.032%	-	-	5,165.00	1.00	-
2018	Underground	Inactive	37.86	0.751%	1.25	0.925%	0.36	0.35	5,165.00	1.00	1,836.46
2019	Underground	Inactive	-	0.670%	0.00	0.809%	-	-	5,165.00	1.00	-
2020	Underground	Inactive	-	0.552%	0.00	0.683%	-	-	5,165.00	1.00	-
2021	Underground	Inactive	-	0.391%	0.00	0.548%	-	-	5,165.00	1.00	-
2022	Underground	Inactive	-	0.179%	0.00	0.404%	-	-	5,165.00	1.00	-
2023	Underground	Inactive	-	0.000%	0.00	0.249%	-	-	5,165.00	1.00	-

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				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Underground	Phased Released	-	0.268%	0.00	1.608%	-	-	5,165.00	0.50	-
1966	Underground	Phased Released	-	0.275%	0.00	1.675%	-	-	5,165.00	0.50	-
1967	Underground	Phased Released	-	0.282%	0.00	1.745%	-	-	5,165.00	0.50	-
1968	Underground	Phased Released	-	0.289%	0.00	1.818%	-	-	5,165.00	0.50	-
1969	Underground	Phased Released	-	0.297%	0.00	1.894%	-	-	5,165.00	0.50	-
1970	Underground	Phased Released	-	0.304%	0.00	1.973%	-	-	5,165.00	0.50	-
1971	Underground	Phased Released	-	0.312%	0.00	2.055%	-	-	5,165.00	0.50	-
1972	Underground	Phased Released	-	0.320%	0.00	2.140%	-	-	5,165.00	0.50	-
1973	Underground	Phased Released	-	0.328%	0.00	2.230%	-	-	5,165.00	0.50	-
1974	Underground	Phased Released	-	0.337%	0.00	2.323%	-	-	5,165.00	0.50	-
1975	Underground	Phased Released	-	0.345%	0.00	2.419%	-	-	5,165.00	0.50	-
1976	Underground	Phased Released	-	0.354%	0.00	2.520%	-	-	5,165.00	0.50	-
1977	Underground	Phased Released	-	0.363%	0.00	2.625%	-	-	5,165.00	0.50	-
1978	Underground	Phased Released	10.58	0.372%	1.25	2.912%	0.05	0.31	5,165.00	0.50	127.20
1979	Underground	Phased Released	59.68	0.382%	1.25	3.201%	0.28	1.91	5,165.00	0.50	735.94
1980	Underground	Phased Released	87.19	0.392%	1.25	3.490%	0.43	3.04	5,165.00	0.50	1,102.74
1981	Underground	Phased Released	66.33	0.402%	1.13	3.780%	0.30	2.51	5,165.00	0.50	780.12
1982	Underground	Phased Released	194.36	0.412%	1.25	4.068%	1.00	7.91	5,165.00	0.50	2,585.86
1983	Underground	Phased Released	70.38	0.423%	1.25	4.353%	0.37	3.06	5,165.00	0.50	960.38
1984	Underground	Phased Released	80.60	0.434%	0.55	4.635%	0.19	3.74	5,165.00	0.50	496.34
1985	Underground	Phased Released	17.24	0.445%	1.25	4.912%	0.10	0.85	5,165.00	0.50	247.47
1986	Underground	Phased Released	118.96	0.456%	1.25	5.183%	0.68	6.17	5,165.00	0.50	1,751.38
1987	Underground	Phased Released	67.09	0.468%	1.25	5.447%	0.39	3.65	5,165.00	0.50	1,013.05
1988	Underground	Phased Released	197.49	0.480%	1.25	5.704%	1.18	11.26	5,165.00	0.50	3,058.54
1989	Underground	Phased Released	80.68	0.492%	1.25	5.951%	0.50	4.80	5,165.00	0.50	1,281.54
1990	Underground	Phased Released	18.31	0.505%	1.25	6.188%	0.12	1.13	5,165.00	0.50	298.30
1991	Underground	Phased Released	23.22	0.518%	1.25	6.414%	0.15	1.49	5,165.00	0.50	387.99
1992	Underground	Phased Released	39.95	0.531%	1.25	6.628%	0.27	2.65	5,165.00	0.50	684.65
1993	Underground	Phased Released	68.38	0.544%	1.25	6.828%	0.47	4.67	5,165.00	0.50	1,201.92
1994	Underground	Phased Released	18.79	0.558%	1.25	7.013%	0.13	1.32	5,165.00	0.50	338.74
1995	Underground	Phased Released	60.54	0.592%	1.25	7.183%	0.45	4.35	5,165.00	0.50	1,157.01
1996	Underground	Phased Released	133.37	0.625%	1.25	7.336%	1.04	9.78	5,165.00	0.50	2,691.52
1997	Underground	Phased Released	119.99	0.658%	1.25	7.471%	0.99	8.96	5,165.00	0.50	2,547.55
1998	Underground	Phased Released	64.00	0.690%	1.25	7.588%	0.55	4.86	5,165.00	0.50	1,424.53
1999	Underground	Phased Released	246.00	0.720%	0.90	7.684%	1.60	18.90	5,165.00	0.50	4,119.29
2000	Underground	Phased Released	59.65	0.750%	1.25	7.759%	0.56	4.63	5,165.00	0.50	1,444.90
2001	Underground	Phased Released	36.60	0.779%	1.25	7.812%	0.36	2.86	5,165.00	0.50	920.55
2002	Underground	Phased Released	48.55	0.807%	1.25	7.842%	0.49	3.81	5,165.00	0.50	1,264.15
2003	Underground	Phased Released	31.05	0.833%	1.25	7.847%	0.32	2.44	5,165.00	0.50	834.56
2004	Underground	Phased Released	-	0.857%	0.00	7.827%	-	-	5,165.00	0.50	-
2005	Underground	Phased Released	21.73	0.880%	1.25	7.780%	0.24	1.69	5,165.00	0.50	617.12
2006	Underground	Phased Released	-	0.901%	0.00	7.706%	-	-	5,165.00	0.50	-
2007	Underground	Phased Released	-	0.919%	0.00	7.602%	-	-	5,165.00	0.50	-
2008	Underground	Phased Released	63.64	0.936%	1.25	7.469%	0.74	4.75	5,165.00	0.50	1,922.94
2009	Underground	Phased Released	54.60	0.950%	1.25	7.305%	0.65	3.99	5,165.00	0.50	1,675.06
2010	Underground	Phased Released	-	0.962%	0.00	7.109%	-	-	5,165.00	0.50	-
2011	Underground	Phased Released	25.60	0.972%	1.25	6.880%	0.31	1.76	5,165.00	0.50	802.89
2012	Underground	Phased Released	-	0.978%	0.00	6.616%	-	-	5,165.00	0.50	-
2013	Underground	Phased Released	-	0.982%	0.00	6.317%	-	-	5,165.00	0.50	-
2014	Underground	Phased Released	-	0.982%	0.00	5.982%	-	-	5,165.00	0.50	-
2015	Underground	Phased Released	-	0.975%	0.00	5.609%	-	-	5,165.00	0.50	-
2016	Underground	Phased Released	-	0.961%	0.00	5.198%	-	-	5,165.00	0.50	-
2017	Underground	Phased Released	-	0.928%	0.00	4.747%	-	-	5,165.00	0.50	-
2018	Underground	Phased Released	-	0.869%	0.00	4.255%	-	-	5,165.00	0.50	-
2019	Underground	Phased Released	-	0.775%	0.00	3.721%	-	-	5,165.00	0.50	-
2020	Underground	Phased Released	-	0.638%	0.00	3.144%	-	-	5,165.00	0.50	-
2021	Underground	Phased Released	-	0.452%	0.00	2.523%	-	-	5,165.00	0.50	-
2022	Underground	Phased Released	-	0.207%	0.00	1.857%	-	-	5,165.00	0.50	-
2023	Underground	Phased Released	-	0.000%	0.00	1.144%	-	-	5,165.00	0.50	-

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				2024							
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Forfeiture Rate (5)	Adjustment Factor Permit Bond Size (6)	Release Rate (7)	Forfeited Acres (8)	Released Acres (9)	Avg Recl Cost per Acre (10)	Adjustment Factor Permit Status (11)	Gross Cost (12)
1965	Other	Active	-	0.146%	0.00	1.975%	-	-	13,035.00	1.00	-
1966	Other	Active	-	0.150%	0.00	2.015%	-	-	13,035.00	1.00	-
1967	Other	Active	-	0.154%	0.00	2.056%	-	-	13,035.00	1.00	-
1968	Other	Active	-	0.158%	0.00	2.098%	-	-	13,035.00	1.00	-
1969	Other	Active	-	0.162%	0.00	2.141%	-	-	13,035.00	1.00	-
1970	Other	Active	-	0.166%	0.00	2.185%	-	-	13,035.00	1.00	-
1971	Other	Active	-	0.170%	0.00	2.229%	-	-	13,035.00	1.00	-
1972	Other	Active	20.00	0.175%	1.25	2.275%	0.04	0.45	13,035.00	1.00	569.76
1973	Other	Active	-	0.179%	0.00	2.321%	-	-	13,035.00	1.00	-
1974	Other	Active	28.52	0.184%	1.25	2.368%	0.07	0.68	13,035.00	1.00	854.68
1975	Other	Active	6.20	0.189%	1.25	2.417%	0.01	0.15	13,035.00	1.00	190.56
1976	Other	Active	-	0.193%	0.00	2.466%	-	-	13,035.00	1.00	-
1977	Other	Active	223.99	0.198%	1.08	2.516%	0.48	5.64	13,035.00	1.00	6,228.25
1978	Other	Active	-	0.204%	0.00	2.568%	-	-	13,035.00	1.00	-
1979	Other	Active	65.00	0.209%	1.25	2.570%	0.17	1.67	13,035.00	1.00	2,210.77
1980	Other	Active	364.74	0.214%	1.05	2.541%	0.82	9.27	13,035.00	1.00	10,687.79
1981	Other	Active	5,211.96	0.220%	0.91	2.483%	10.41	129.40	13,035.00	1.00	135,636.36
1982	Other	Active	586.43	0.225%	0.90	2.400%	1.19	14.08	13,035.00	1.00	15,494.04
1983	Other	Active	3,861.09	0.231%	0.86	2.296%	7.68	88.66	13,035.00	1.00	100,108.39
1984	Other	Active	4,421.79	0.237%	0.76	2.174%	8.01	96.14	13,035.00	1.00	104,395.44
1985	Other	Active	1,543.19	0.243%	1.03	2.038%	3.88	31.45	13,035.00	1.00	50,569.71
1986	Other	Active	1,384.69	0.249%	0.95	1.891%	3.29	26.18	13,035.00	1.00	42,906.04
1987	Other	Active	974.10	0.256%	1.00	1.737%	2.49	16.92	13,035.00	1.00	32,455.36
1988	Other	Active	618.27	0.262%	1.06	1.578%	1.71	9.76	13,035.00	1.00	22,301.68
1989	Other	Active	290.43	0.269%	1.15	1.419%	0.90	4.12	13,035.00	1.00	11,706.12
1990	Other	Active	344.46	0.276%	0.97	1.264%	0.92	4.35	13,035.00	1.00	12,011.01
1991	Other	Active	491.29	0.283%	1.19	1.115%	1.66	5.48	13,035.00	1.00	21,585.25
1992	Other	Active	391.14	0.290%	1.04	0.976%	1.18	3.82	13,035.00	1.00	15,382.45
1993	Other	Active	946.05	0.298%	0.80	0.850%	2.24	8.04	13,035.00	1.00	29,170.00
1994	Other	Active	2,315.41	0.305%	0.87	0.742%	6.17	17.18	13,035.00	1.00	80,413.88
1995	Other	Active	950.69	0.313%	1.08	0.654%	3.20	6.22	13,035.00	1.00	41,695.90
1996	Other	Active	1,971.02	0.321%	0.78	0.591%	4.96	11.64	13,035.00	1.00	64,606.92
1997	Other	Active	1,403.71	0.329%	0.90	0.555%	4.16	7.78	13,035.00	1.00	54,219.64
1998	Other	Active	1,144.42	0.338%	1.04	0.549%	4.02	6.29	13,035.00	1.00	52,390.30
1999	Other	Active	404.95	0.346%	0.97	0.579%	1.36	2.34	13,035.00	1.00	17,733.75
2000	Other	Active	222.50	0.355%	0.90	0.646%	0.71	1.44	13,035.00	1.00	9,272.47
2001	Other	Active	381.08	0.364%	0.83	0.756%	1.15	2.88	13,035.00	1.00	15,021.47
2002	Other	Active	818.79	0.374%	1.16	0.910%	3.56	7.45	13,035.00	1.00	46,363.82
2003	Other	Active	908.39	0.383%	1.13	1.112%	3.95	10.10	13,035.00	1.00	51,432.67
2004	Other	Active	1,149.70	0.455%	0.99	1.367%	5.16	15.71	13,035.00	1.00	67,299.24
2005	Other	Active	23.99	0.535%	0.90	1.677%	0.12	0.40	13,035.00	1.00	1,506.39
2006	Other	Active	491.96	0.625%	1.00	2.046%	3.08	10.07	13,035.00	1.00	40,092.51
2007	Other	Active	394.47	0.725%	1.08	2.478%	3.07	9.77	13,035.00	1.00	40,079.68
2008	Other	Active	599.63	0.835%	1.10	2.975%	5.51	17.84	13,035.00	1.00	71,822.45
2009	Other	Active	174.78	0.956%	1.08	3.542%	1.80	6.19	13,035.00	1.00	23,425.41
2010	Other	Active	1,066.83	1.084%	0.98	4.182%	11.31	44.62	13,035.00	1.00	147,423.88
2011	Other	Active	365.79	1.207%	0.90	4.899%	3.97	17.92	13,035.00	1.00	51,777.38
2012	Other	Active	213.57	1.304%	1.16	5.695%	3.24	12.16	13,035.00	1.00	42,198.26
2013	Other	Active	2,100.30	1.358%	1.00	6.575%	28.45	138.10	13,035.00	1.00	370,783.08
2014	Other	Active	282.83	1.351%	1.21	7.542%	4.61	21.33	13,035.00	1.00	60,080.52
2015	Other	Active	1,105.29	1.264%	1.13	8.768%	15.84	96.91	13,035.00	1.00	206,469.97
2016	Other	Active	1,513.50	1.100%	1.13	11.452%	18.88	173.33	13,035.00	1.00	246,043.99
2017	Other	Active	385.95	0.861%	1.13	16.294%	3.77	62.89	13,035.00	1.00	49,094.31
2018	Other	Active	21.89	0.596%	1.25	22.013%	0.16	4.82	13,035.00	1.00	2,125.68
2019	Other	Active	6.47	0.341%	1.25	26.670%	0.03	1.73	13,035.00	1.00	359.36
2020	Other	Active	563.58	0.187%	1.13	28.373%	1.19	159.90	13,035.00	1.00	15,564.93
2021	Other	Active	122.97	0.033%	1.25	25.229%	0.05	31.02	13,035.00	1.00	659.93
2022	Other	Active	605.48	0.000%	1.21	15.346%	-	92.92	13,035.00	1.00	-
2023	Other	Active	863.80	0.000%	1.25	0.000%	-	0.00	13,035.00	1.00	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Other	Inactive	-	0.335%	0.00	1.162%	-	-	13,035.00	1.00	-
1966	Other	Inactive	-	0.343%	0.00	1.185%	-	-	13,035.00	1.00	-
1967	Other	Inactive	-	0.352%	0.00	1.209%	-	-	13,035.00	1.00	-
1968	Other	Inactive	-	0.361%	0.00	1.234%	-	-	13,035.00	1.00	-
1969	Other	Inactive	-	0.370%	0.00	1.259%	-	-	13,035.00	1.00	-
1970	Other	Inactive	-	0.380%	0.00	1.285%	-	-	13,035.00	1.00	-
1971	Other	Inactive	-	0.390%	0.00	1.311%	-	-	13,035.00	1.00	-
1972	Other	Inactive	-	0.400%	0.00	1.338%	-	-	13,035.00	1.00	-
1973	Other	Inactive	-	0.410%	0.00	1.365%	-	-	13,035.00	1.00	-
1974	Other	Inactive	-	0.420%	0.00	1.393%	-	-	13,035.00	1.00	-
1975	Other	Inactive	-	0.431%	0.00	1.422%	-	-	13,035.00	1.00	-
1976	Other	Inactive	14.48	0.442%	1.25	1.451%	0.08	0.21	13,035.00	1.00	1,043.36
1977	Other	Inactive	-	0.454%	0.00	1.480%	-	-	13,035.00	1.00	-
1978	Other	Inactive	-	0.465%	0.00	1.510%	-	-	13,035.00	1.00	-
1979	Other	Inactive	7.25	0.477%	1.25	1.512%	0.04	0.11	13,035.00	1.00	563.62
1980	Other	Inactive	114.75	0.489%	0.55	1.494%	0.31	1.71	13,035.00	1.00	4,025.80
1981	Other	Inactive	707.84	0.502%	0.96	1.460%	3.40	10.34	13,035.00	1.00	44,379.69
1982	Other	Inactive	127.20	0.515%	0.90	1.412%	0.59	1.80	13,035.00	1.00	7,681.70
1983	Other	Inactive	1,078.40	0.528%	0.95	1.351%	5.41	14.57	13,035.00	1.00	70,506.12
1984	Other	Inactive	440.78	0.542%	0.90	1.279%	2.15	5.64	13,035.00	1.00	28,001.62
1985	Other	Inactive	1,198.15	0.555%	0.99	1.199%	6.57	14.36	13,035.00	1.00	85,656.91
1986	Other	Inactive	-	0.570%	0.00	1.112%	-	-	13,035.00	1.00	-
1987	Other	Inactive	-	0.584%	0.00	1.021%	-	-	13,035.00	1.00	-
1988	Other	Inactive	29.83	0.599%	1.25	0.928%	0.22	0.28	13,035.00	1.00	2,912.48
1989	Other	Inactive	414.41	0.615%	1.08	0.835%	2.74	3.46	13,035.00	1.00	35,688.99
1990	Other	Inactive	481.66	0.630%	1.13	0.743%	3.44	3.58	13,035.00	1.00	44,852.77
1991	Other	Inactive	-	0.647%	0.00	0.656%	-	-	13,035.00	1.00	-
1992	Other	Inactive	332.18	0.663%	1.13	0.574%	2.50	1.91	13,035.00	1.00	32,539.65
1993	Other	Inactive	163.11	0.680%	1.02	0.500%	1.13	0.82	13,035.00	1.00	14,700.64
1994	Other	Inactive	395.55	0.698%	1.08	0.437%	2.97	1.73	13,035.00	1.00	38,661.83
1995	Other	Inactive	641.22	0.715%	1.13	0.385%	5.20	2.47	13,035.00	1.00	67,769.25
1996	Other	Inactive	152.16	0.734%	0.55	0.347%	0.61	0.53	13,035.00	1.00	8,004.36
1997	Other	Inactive	5.95	0.753%	0.55	0.326%	0.02	0.02	13,035.00	1.00	321.02
1998	Other	Inactive	117.09	0.772%	0.55	0.323%	0.50	0.38	13,035.00	1.00	6,479.43
1999	Other	Inactive	-	0.792%	0.00	0.341%	-	-	13,035.00	1.00	-
2000	Other	Inactive	116.73	0.812%	0.55	0.380%	0.52	0.44	13,035.00	1.00	6,795.01
2001	Other	Inactive	144.00	0.833%	0.55	0.444%	0.66	0.64	13,035.00	1.00	8,597.37
2002	Other	Inactive	-	0.854%	0.00	0.535%	-	-	13,035.00	1.00	-
2003	Other	Inactive	-	0.876%	0.00	0.654%	-	-	13,035.00	1.00	-
2004	Other	Inactive	56.00	1.039%	1.25	0.804%	0.73	0.45	13,035.00	1.00	9,484.37
2005	Other	Inactive	50.69	1.223%	1.25	0.986%	0.78	0.50	13,035.00	1.00	10,104.63
2006	Other	Inactive	-	1.429%	0.00	1.204%	-	-	13,035.00	1.00	-
2007	Other	Inactive	-	1.657%	0.00	1.457%	-	-	13,035.00	1.00	-
2008	Other	Inactive	-	1.909%	0.00	1.750%	-	-	13,035.00	1.00	-
2009	Other	Inactive	19.80	2.186%	1.25	2.084%	0.54	0.41	13,035.00	1.00	7,053.17
2010	Other	Inactive	-	2.478%	0.00	2.460%	-	-	13,035.00	1.00	-
2011	Other	Inactive	-	2.758%	0.00	2.882%	-	-	13,035.00	1.00	-
2012	Other	Inactive	-	2.980%	0.00	3.350%	-	-	13,035.00	1.00	-
2013	Other	Inactive	-	3.104%	0.00	3.868%	-	-	13,035.00	1.00	-
2014	Other	Inactive	-	3.088%	0.00	4.437%	-	-	13,035.00	1.00	-
2015	Other	Inactive	-	2.890%	0.00	5.158%	-	-	13,035.00	1.00	-
2016	Other	Inactive	-	2.515%	0.00	6.737%	-	-	13,035.00	1.00	-
2017	Other	Inactive	-	1.968%	0.00	9.585%	-	-	13,035.00	1.00	-
2018	Other	Inactive	11.88	1.362%	1.25	12.949%	0.20	1.54	13,035.00	1.00	2,636.88
2019	Other	Inactive	-	0.779%	0.00	15.689%	-	-	13,035.00	1.00	-
2020	Other	Inactive	-	0.427%	0.00	16.690%	-	-	13,035.00	1.00	-
2021	Other	Inactive	-	0.075%	0.00	14.841%	-	-	13,035.00	1.00	-
2022	Other	Inactive	-	0.000%	0.00	9.027%	-	-	13,035.00	1.00	-
2023	Other	Inactive	-	0.000%	0.00	0.000%	-	-	13,035.00	1.00	-

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Other	Phased Released	-	0.387%	0.00	5.343%	-	-	13,035.00	0.50	-
1966	Other	Phased Released	-	0.397%	0.00	5.452%	-	-	13,035.00	0.50	-
1967	Other	Phased Released	-	0.407%	0.00	5.563%	-	-	13,035.00	0.50	-
1968	Other	Phased Released	-	0.418%	0.00	5.677%	-	-	13,035.00	0.50	-
1969	Other	Phased Released	-	0.428%	0.00	5.793%	-	-	13,035.00	0.50	-
1970	Other	Phased Released	-	0.439%	0.00	5.911%	-	-	13,035.00	0.50	-
1971	Other	Phased Released	-	0.451%	0.00	6.032%	-	-	13,035.00	0.50	-
1972	Other	Phased Released	-	0.462%	0.00	6.155%	-	-	13,035.00	0.50	-
1973	Other	Phased Released	9.00	0.474%	1.25	6.280%	0.05	0.57	13,035.00	0.50	347.49
1974	Other	Phased Released	-	0.486%	0.00	6.409%	-	-	13,035.00	0.50	-
1975	Other	Phased Released	-	0.499%	0.00	6.539%	-	-	13,035.00	0.50	-
1976	Other	Phased Released	27.88	0.511%	1.25	6.673%	0.18	1.86	13,035.00	0.50	1,161.40
1977	Other	Phased Released	-	0.524%	0.00	6.809%	-	-	13,035.00	0.50	-
1978	Other	Phased Released	12.76	0.538%	1.25	6.948%	0.09	0.89	13,035.00	0.50	559.15
1979	Other	Phased Released	58.69	0.552%	1.25	6.954%	0.40	4.08	13,035.00	0.50	2,637.77
1980	Other	Phased Released	7.91	0.566%	1.25	6.875%	0.06	0.54	13,035.00	0.50	364.62
1981	Other	Phased Released	475.54	0.580%	1.08	6.718%	2.97	31.95	13,035.00	0.50	19,335.25
1982	Other	Phased Released	201.26	0.595%	1.25	6.495%	1.50	13.07	13,035.00	0.50	9,759.27
1983	Other	Phased Released	158.90	0.610%	1.02	6.213%	0.99	9.87	13,035.00	0.50	6,427.58
1984	Other	Phased Released	75.79	0.626%	1.25	5.883%	0.59	4.46	13,035.00	0.50	3,866.00
1985	Other	Phased Released	43.00	0.642%	1.25	5.515%	0.35	2.37	13,035.00	0.50	2,249.65
1986	Other	Phased Released	-	0.659%	0.00	5.117%	-	-	13,035.00	0.50	-
1987	Other	Phased Released	-	0.676%	0.00	4.699%	-	-	13,035.00	0.50	-
1988	Other	Phased Released	-	0.693%	0.00	4.270%	-	-	13,035.00	0.50	-
1989	Other	Phased Released	62.20	0.711%	1.25	3.841%	0.55	2.39	13,035.00	0.50	3,600.96
1990	Other	Phased Released	-	0.729%	0.00	3.420%	-	-	13,035.00	0.50	-
1991	Other	Phased Released	-	0.748%	0.00	3.016%	-	-	13,035.00	0.50	-
1992	Other	Phased Released	-	0.767%	0.00	2.640%	-	-	13,035.00	0.50	-
1993	Other	Phased Released	-	0.786%	0.00	2.301%	-	-	13,035.00	0.50	-
1994	Other	Phased Released	-	0.807%	0.00	2.008%	-	-	13,035.00	0.50	-
1995	Other	Phased Released	-	0.827%	0.00	1.771%	-	-	13,035.00	0.50	-
1996	Other	Phased Released	-	0.848%	0.00	1.598%	-	-	13,035.00	0.50	-
1997	Other	Phased Released	31.16	0.870%	1.25	1.501%	0.34	0.47	13,035.00	0.50	2,208.96
1998	Other	Phased Released	-	0.892%	0.00	1.487%	-	-	13,035.00	0.50	-
1999	Other	Phased Released	179.00	0.915%	0.55	1.567%	0.90	2.80	13,035.00	0.50	5,873.36
2000	Other	Phased Released	-	0.939%	0.00	1.749%	-	-	13,035.00	0.50	-
2001	Other	Phased Released	-	0.963%	0.00	2.044%	-	-	13,035.00	0.50	-
2002	Other	Phased Released	-	0.988%	0.00	2.461%	-	-	13,035.00	0.50	-
2003	Other	Phased Released	-	1.013%	0.00	3.009%	-	-	13,035.00	0.50	-
2004	Other	Phased Released	-	1.202%	0.00	3.698%	-	-	13,035.00	0.50	-
2005	Other	Phased Released	-	1.415%	0.00	4.538%	-	-	13,035.00	0.50	-
2006	Other	Phased Released	-	1.652%	0.00	5.536%	-	-	13,035.00	0.50	-
2007	Other	Phased Released	-	1.916%	0.00	6.704%	-	-	13,035.00	0.50	-
2008	Other	Phased Released	9.90	2.208%	1.25	8.051%	0.27	0.80	13,035.00	0.50	1,780.63
2009	Other	Phased Released	-	2.528%	0.00	9.585%	-	-	13,035.00	0.50	-
2010	Other	Phased Released	-	2.865%	0.00	11.317%	-	-	13,035.00	0.50	-
2011	Other	Phased Released	-	3.189%	0.00	13.256%	-	-	13,035.00	0.50	-
2012	Other	Phased Released	-	3.446%	0.00	15.411%	-	-	13,035.00	0.50	-
2013	Other	Phased Released	-	3.589%	0.00	17.792%	-	-	13,035.00	0.50	-
2014	Other	Phased Released	-	3.571%	0.00	20.408%	-	-	13,035.00	0.50	-
2015	Other	Phased Released	115.00	3.342%	1.25	23.725%	4.80	27.28	13,035.00	0.50	31,309.39
2016	Other	Phased Released	-	2.908%	0.00	30.988%	-	-	13,035.00	0.50	-
2017	Other	Phased Released	-	2.276%	0.00	44.089%	-	-	13,035.00	0.50	-
2018	Other	Phased Released	-	1.575%	0.00	59.565%	-	-	13,035.00	0.50	-
2019	Other	Phased Released	-	0.901%	0.00	72.167%	-	-	13,035.00	0.50	-
2020	Other	Phased Released	-	0.494%	0.00	76.774%	-	-	13,035.00	0.50	-
2021	Other	Phased Released	-	0.087%	0.00	68.266%	-	-	13,035.00	0.50	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Surface	Active	-	-	0.06%	-	0.82%	-	-	3,030.00	1	-
1966	Surface	Active	-	-	0.06%	-	0.82%	-	-	3,030.00	1	-
1967	Surface	Active	-	-	0.06%	-	0.86%	-	-	3,030.00	1	-
1968	Surface	Active	-	-	0.07%	-	0.89%	-	-	3,030.00	1	-
1969	Surface	Active	-	-	0.07%	-	0.93%	-	-	3,030.00	1	-
1970	Surface	Active	-	-	0.07%	-	0.97%	-	-	3,030.00	1	-
1971	Surface	Active	-	-	0.08%	-	1.01%	-	-	3,030.00	1	-
1972	Surface	Active	400.00	395.20	0.08%	1.25	1.05%	0.41	4.14	3,030.00	1	1,229.02
1973	Surface	Active	-	-	0.09%	-	1.09%	-	-	3,030.00	1	-
1974	Surface	Active	-	-	0.09%	-	1.14%	-	-	3,030.00	1	-
1975	Surface	Active	-	-	0.10%	-	1.19%	-	-	3,030.00	1	-
1976	Surface	Active	-	-	0.10%	-	1.23%	-	-	3,030.00	1	-
1977	Surface	Active	1,504.07	1,482.21	0.11%	1.02	1.29%	1.60	19.07	3,030.00	1	4,845.12
1978	Surface	Active	2,061.88	2,030.92	0.11%	0.90	1.34%	2.04	27.21	3,030.00	1	6,186.26
1979	Surface	Active	180.00	177.18	0.12%	0.90	1.40%	0.19	2.47	3,030.00	1	568.11
1980	Surface	Active	475.70	467.76	0.12%	0.90	1.45%	0.52	6.80	3,030.00	1	1,578.74
1981	Surface	Active	1,999.30	1,963.85	0.13%	0.94	1.55%	2.41	30.48	3,030.00	1	7,316.22
1982	Surface	Active	216.78	212.75	0.14%	0.90	1.64%	0.26	3.50	3,030.00	1	795.63
1983	Surface	Active	1,708.57	1,675.32	0.14%	0.90	1.73%	2.18	28.97	3,030.00	1	6,595.01
1984	Surface	Active	-	-	0.15%	-	1.81%	-	-	3,030.00	1	-
1985	Surface	Active	2,501.65	2,449.66	0.16%	0.76	1.88%	2.98	46.12	3,030.00	1	9,022.92
1986	Surface	Active	2,503.23	2,448.49	0.17%	0.99	1.95%	4.07	47.75	3,030.00	1	12,335.00
1987	Surface	Active	1,371.12	1,340.17	0.18%	1.02	2.01%	2.41	26.96	3,030.00	1	7,316.77
1988	Surface	Active	1,677.10	1,638.77	0.19%	0.86	2.07%	2.62	33.88	3,030.00	1	7,931.87
1989	Surface	Active	2,103.52	2,054.15	0.20%	0.90	2.12%	3.63	43.49	3,030.00	1	11,000.35
1990	Surface	Active	2,621.86	2,559.43	0.21%	0.84	2.16%	4.42	55.31	3,030.00	1	13,407.47
1991	Surface	Active	2,000.59	1,951.46	0.22%	0.98	2.20%	4.15	42.92	3,030.00	1	12,580.14
1992	Surface	Active	4,639.40	4,524.55	0.23%	0.90	2.23%	9.33	100.98	3,030.00	1	28,260.51
1993	Surface	Active	4,377.78	4,267.98	0.24%	0.90	2.26%	9.26	96.39	3,030.00	1	28,061.04
1994	Surface	Active	1,898.65	1,851.27	0.25%	0.75	2.28%	3.52	42.20	3,030.00	1	10,676.91
1995	Surface	Active	7,733.29	7,534.19	0.27%	0.96	2.30%	19.29	172.92	3,030.00	1	58,444.62
1996	Surface	Active	6,830.47	6,652.76	0.28%	0.99	2.31%	18.47	153.35	3,030.00	1	55,976.57
1997	Surface	Active	11,904.74	11,594.38	0.30%	0.96	2.31%	32.89	267.77	3,030.00	1	99,657.04
1998	Surface	Active	11,419.01	11,123.75	0.31%	0.87	2.31%	29.98	256.78	3,030.00	1	90,842.20
1999	Surface	Active	2,008.81	1,957.17	0.33%	0.81	2.30%	5.22	45.05	3,030.00	1	15,803.33
2000	Surface	Active	4,046.61	3,942.25	0.35%	0.84	2.29%	11.46	90.28	3,030.00	1	34,710.24
2001	Surface	Active	7,748.62	7,546.56	0.36%	0.93	2.27%	25.60	171.53	3,030.00	1	77,559.61
2002	Surface	Active	6,126.39	5,967.72	0.38%	0.93	2.25%	21.12	134.31	3,030.00	1	63,984.64
2003	Surface	Active	9,797.63	9,546.09	0.40%	0.92	2.22%	34.79	212.20	3,030.00	1	105,428.61
2004	Surface	Active	12,659.51	12,337.11	0.41%	0.93	2.19%	47.15	270.19	3,030.00	1	142,867.68
2005	Surface	Active	4,606.35	4,488.27	0.42%	1.04	2.15%	19.80	96.59	3,030.00	1	59,993.43
2006	Surface	Active	5,201.55	5,071.83	0.44%	0.96	2.11%	21.36	106.96	3,030.00	1	64,724.60
2007	Surface	Active	5,703.65	5,564.67	0.45%	0.93	2.06%	23.27	114.68	3,030.00	1	70,499.19
2008	Surface	Active	9,829.70	9,598.21	0.46%	0.86	2.01%	38.01	192.70	3,030.00	1	115,161.73
2009	Surface	Active	6,204.14	6,060.82	0.47%	0.88	1.95%	25.13	118.16	3,030.00	1	76,130.98
2010	Surface	Active	4,481.21	4,377.77	0.48%	1.00	1.89%	21.02	82.59	3,030.00	1	63,697.97
2011	Surface	Active	2,487.54	2,433.48	0.49%	0.85	1.82%	10.22	44.26	3,030.00	1	30,952.94
2012	Surface	Active	8,236.40	8,060.65	0.50%	0.92	1.75%	36.94	140.73	3,030.00	1	111,913.98
2013	Surface	Active	8,588.04	8,409.16	0.51%	0.96	1.67%	41.21	140.30	3,030.00	1	124,860.11
2014	Surface	Active	6,755.47	6,625.08	0.52%	0.83	1.59%	28.22	105.08	3,030.00	1	85,505.42
2015	Surface	Active	3,846.62	3,774.10	0.52%	0.90	1.50%	17.71	56.58	3,030.00	1	53,670.53
2016	Surface	Active	3,384.53	3,324.96	0.53%	0.86	1.41%	15.04	46.96	3,030.00	1	45,585.19
2017	Surface	Active	1,137.87	1,118.08	0.52%	1.08	1.31%	6.30	14.63	3,030.00	1	19,081.36
2018	Surface	Active	3,687.08	3,630.11	0.51%	1.03	1.19%	19.16	43.15	3,030.00	1	58,058.64
2019	Surface	Active	4,472.27	4,414.77	0.48%	0.94	1.05%	20.18	46.16	3,030.00	1	61,149.57
2020	Surface	Active	3,978.72	3,941.48	0.44%	0.74	0.87%	12.75	34.43	3,030.00	1	38,645.63
2021	Surface	Active	3,857.52	3,832.81	0.36%	0.85	0.67%	11.86	25.54	3,030.00	1	35,949.19
2022	Surface	Active	5,387.71	5,374.11	0.26%	1.04	0.42%	14.64	22.46	3,030.00	1	44,346.19
2023	Surface	Active	3,969.18	3,969.18	0.13%	0.99	0.12%	4.93	4.86	3,030.00	1	14,936.27

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Surface	Inactive	-	-	0.14%	-	0.48%	-	-	3,030.00	1	-
1966	Surface	Inactive	-	-	0.14%	-	0.48%	-	-	3,030.00	1	-
1967	Surface	Inactive	-	-	0.15%	-	0.50%	-	-	3,030.00	1	-
1968	Surface	Inactive	-	-	0.15%	-	0.52%	-	-	3,030.00	1	-
1969	Surface	Inactive	-	-	0.16%	-	0.55%	-	-	3,030.00	1	-
1970	Surface	Inactive	-	-	0.17%	-	0.57%	-	-	3,030.00	1	-
1971	Surface	Inactive	-	-	0.18%	-	0.59%	-	-	3,030.00	1	-
1972	Surface	Inactive	-	-	0.19%	-	0.62%	-	-	3,030.00	1	-
1973	Surface	Inactive	-	-	0.20%	-	0.64%	-	-	3,030.00	1	-
1974	Surface	Inactive	-	-	0.21%	-	0.67%	-	-	3,030.00	1	-
1975	Surface	Inactive	-	-	0.22%	-	0.70%	-	-	3,030.00	1	-
1976	Surface	Inactive	438.80	434.89	0.23%	0.55	0.73%	0.55	3.16	3,030.00	1	1,669.97
1977	Surface	Inactive	-	-	0.24%	-	0.76%	-	-	3,030.00	1	-
1978	Surface	Inactive	-	-	0.26%	-	0.79%	-	-	3,030.00	1	-
1979	Surface	Inactive	-	-	0.27%	-	0.82%	-	-	3,030.00	1	-
1980	Surface	Inactive	-	-	0.28%	-	0.86%	-	-	3,030.00	1	-
1981	Surface	Inactive	-	-	0.30%	-	0.91%	-	-	3,030.00	1	-
1982	Surface	Inactive	-	-	0.31%	-	0.97%	-	-	3,030.00	1	-
1983	Surface	Inactive	-	-	0.33%	-	1.02%	-	-	3,030.00	1	-
1984	Surface	Inactive	-	-	0.35%	-	1.06%	-	-	3,030.00	1	-
1985	Surface	Inactive	-	-	0.37%	-	1.11%	-	-	3,030.00	1	-
1986	Surface	Inactive	411.07	404.71	0.38%	0.90	1.15%	1.40	4.64	3,030.00	1	4,247.26
1987	Surface	Inactive	415.61	408.65	0.41%	1.08	1.18%	1.78	4.84	3,030.00	1	5,392.16
1988	Surface	Inactive	1,304.38	1,282.87	0.43%	0.90	1.22%	4.92	15.60	3,030.00	1	14,917.70
1989	Surface	Inactive	176.00	173.01	0.45%	0.90	1.25%	0.70	2.15	3,030.00	1	2,117.77
1990	Surface	Inactive	70.12	69.02	0.47%	0.55	1.27%	0.18	0.88	3,030.00	1	543.47
1991	Surface	Inactive	-	-	0.50%	-	1.29%	-	-	3,030.00	1	-
1992	Surface	Inactive	-	-	0.52%	-	1.31%	-	-	3,030.00	1	-
1993	Surface	Inactive	-	-	0.55%	-	1.33%	-	-	3,030.00	1	-
1994	Surface	Inactive	-	-	0.58%	-	1.34%	-	-	3,030.00	1	-
1995	Surface	Inactive	2,098.71	2,058.11	0.61%	0.90	1.35%	11.31	27.79	3,030.00	1	34,270.84
1996	Surface	Inactive	-	-	0.64%	-	1.36%	-	-	3,030.00	1	-
1997	Surface	Inactive	-	-	0.68%	-	1.36%	-	-	3,030.00	1	-
1998	Surface	Inactive	846.89	829.71	0.71%	0.90	1.36%	5.32	11.27	3,030.00	1	16,114.25
1999	Surface	Inactive	1,733.11	1,692.67	0.75%	1.25	1.35%	15.86	22.92	3,030.00	1	48,061.81
2000	Surface	Inactive	-	-	0.79%	-	1.35%	-	-	3,030.00	1	-
2001	Surface	Inactive	-	-	0.83%	-	1.34%	-	-	3,030.00	1	-
2002	Surface	Inactive	1,146.85	1,123.70	0.87%	0.78	1.32%	7.70	14.88	3,030.00	1	23,320.97
2003	Surface	Inactive	1,161.50	1,136.72	0.91%	0.90	1.31%	9.28	14.86	3,030.00	1	28,119.63
2004	Surface	Inactive	3,700.97	3,621.82	0.94%	0.90	1.29%	30.60	46.66	3,030.00	1	92,731.35
2005	Surface	Inactive	-	-	0.97%	-	1.27%	-	-	3,030.00	1	-
2006	Surface	Inactive	244.59	240.24	1.00%	0.55	1.24%	1.32	2.98	3,030.00	1	3,999.70
2007	Surface	Inactive	1,080.24	1,061.22	1.03%	0.55	1.21%	6.00	12.86	3,030.00	1	18,165.58
2008	Surface	Inactive	118.60	115.64	1.05%	1.25	1.18%	1.52	1.37	3,030.00	1	4,615.88
2009	Surface	Inactive	680.43	668.75	1.08%	0.55	1.15%	3.97	7.67	3,030.00	1	12,026.08
2010	Surface	Inactive	1,146.11	1,120.00	1.10%	1.08	1.11%	13.28	12.43	3,030.00	1	40,225.17
2011	Surface	Inactive	1,088.67	1,067.73	1.12%	0.78	1.07%	9.40	11.42	3,030.00	1	28,496.07
2012	Surface	Inactive	-	-	1.14%	-	1.03%	-	-	3,030.00	1	-
2013	Surface	Inactive	93.44	91.96	1.16%	0.55	0.98%	0.59	0.90	3,030.00	1	1,781.37
2014	Surface	Inactive	415.42	407.30	1.18%	0.90	0.93%	4.32	3.80	3,030.00	1	13,086.85
2015	Surface	Inactive	1,156.30	1,137.44	1.19%	0.67	0.88%	9.04	10.03	3,030.00	1	27,386.53
2016	Surface	Inactive	776.75	764.03	1.20%	0.73	0.83%	6.65	6.35	3,030.00	1	20,157.93
2017	Surface	Inactive	154.63	151.92	1.20%	0.90	0.77%	1.64	1.17	3,030.00	1	4,961.44
2018	Surface	Inactive	351.08	345.42	1.17%	0.90	0.70%	3.64	2.42	3,030.00	1	11,020.41
2019	Surface	Inactive	452.10	445.72	1.11%	0.90	0.62%	4.44	2.74	3,030.00	1	13,457.05
2020	Surface	Inactive	-	-	1.00%	-	0.51%	-	-	3,030.00	1	-
2021	Surface	Inactive	-	-	0.83%	-	0.39%	-	-	3,030.00	1	-
2022	Surface	Inactive	-	-	0.60%	-	0.25%	-	-	3,030.00	1	-
2023	Surface	Inactive	-	-	0.29%	-	0.07%	-	-	3,030.00	1	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2025								
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Surface	Phased Released	-	-	0.16%	-	2.22%	-	-	3,030.00	0.5	-
1966	Surface	Phased Released	-	-	0.16%	-	2.22%	-	-	3,030.00	0.5	-
1967	Surface	Phased Released	-	-	0.17%	-	2.31%	-	-	3,030.00	0.5	-
1968	Surface	Phased Released	-	-	0.18%	-	2.41%	-	-	3,030.00	0.5	-
1969	Surface	Phased Released	-	-	0.19%	-	2.51%	-	-	3,030.00	0.5	-
1970	Surface	Phased Released	-	-	0.20%	-	2.62%	-	-	3,030.00	0.5	-
1971	Surface	Phased Released	-	-	0.21%	-	2.72%	-	-	3,030.00	0.5	-
1972	Surface	Phased Released	-	-	0.22%	-	2.84%	-	-	3,030.00	0.5	-
1973	Surface	Phased Released	-	-	0.23%	-	2.96%	-	-	3,030.00	0.5	-
1974	Surface	Phased Released	189.60	182.92	0.24%	1.25	3.08%	0.55	5.63	3,030.00	0.5	832.91
1975	Surface	Phased Released	7.80	7.51	0.25%	1.25	3.21%	0.02	0.24	3,030.00	0.5	36.01
1976	Surface	Phased Released	626.17	602.18	0.27%	1.25	3.34%	2.01	20.12	3,030.00	0.5	3,038.23
1977	Surface	Phased Released	48.00	46.08	0.28%	1.25	3.48%	0.16	1.60	3,030.00	0.5	244.74
1978	Surface	Phased Released	158.81	152.20	0.30%	1.25	3.63%	0.56	5.52	3,030.00	0.5	850.84
1979	Surface	Phased Released	358.00	342.45	0.31%	1.25	3.78%	1.33	12.93	3,030.00	0.5	2,015.22
1980	Surface	Phased Released	253.42	241.69	0.33%	1.25	3.93%	0.99	9.51	3,030.00	0.5	1,497.11
1981	Surface	Phased Released	1,785.41	1,699.53	0.34%	1.00	4.20%	5.85	71.37	3,030.00	0.5	8,865.30
1982	Surface	Phased Released	-	-	0.36%	-	4.45%	-	-	3,030.00	0.5	-
1983	Surface	Phased Released	302.61	286.28	0.38%	1.25	4.68%	1.37	13.40	3,030.00	0.5	2,068.31
1984	Surface	Phased Released	2,585.75	2,442.28	0.40%	1.08	4.90%	10.54	119.55	3,030.00	0.5	15,973.41
1985	Surface	Phased Released	1,270.29	1,198.17	0.42%	0.90	5.09%	4.56	61.04	3,030.00	0.5	6,906.08
1986	Surface	Phased Released	1,041.15	980.08	0.44%	0.90	5.28%	3.93	51.72	3,030.00	0.5	5,946.39
1987	Surface	Phased Released	760.81	714.87	0.47%	0.90	5.44%	3.01	38.91	3,030.00	0.5	4,565.57
1988	Surface	Phased Released	478.00	447.51	0.49%	1.25	5.59%	2.76	25.03	3,030.00	0.5	4,178.47
1989	Surface	Phased Released	1,098.64	1,027.73	0.52%	1.11	5.73%	5.92	58.88	3,030.00	0.5	8,969.72
1990	Surface	Phased Released	764.18	713.21	0.55%	1.25	5.85%	4.87	41.71	3,030.00	0.5	7,378.70
1991	Surface	Phased Released	1,006.45	939.76	0.58%	0.97	5.95%	5.24	55.93	3,030.00	0.5	7,941.80
1992	Surface	Phased Released	-	-	0.61%	-	6.04%	-	-	3,030.00	0.5	-
1993	Surface	Phased Released	562.59	523.17	0.64%	1.25	6.11%	4.17	31.97	3,030.00	0.5	6,313.00
1994	Surface	Phased Released	386.03	359.60	0.67%	0.90	6.17%	2.17	22.18	3,030.00	0.5	3,288.70
1995	Surface	Phased Released	484.30	450.01	0.71%	1.13	6.21%	3.60	27.95	3,030.00	0.5	5,455.30
1996	Surface	Phased Released	675.12	628.18	0.74%	0.90	6.24%	4.20	39.18	3,030.00	0.5	6,365.55
1997	Surface	Phased Released	969.50	900.36	0.78%	1.08	6.25%	7.57	56.26	3,030.00	0.5	11,471.28
1998	Surface	Phased Released	511.73	476.38	0.82%	0.78	6.25%	3.07	29.76	3,030.00	0.5	4,655.48
1999	Surface	Phased Released	14.87	13.78	0.87%	1.25	6.23%	0.15	0.86	3,030.00	0.5	226.19
2000	Surface	Phased Released	19.70	18.25	0.91%	1.25	6.20%	0.21	1.13	3,030.00	0.5	315.38
2001	Surface	Phased Released	491.55	456.56	0.96%	1.02	6.15%	4.46	28.08	3,030.00	0.5	6,754.18
2002	Surface	Phased Released	154.49	143.17	1.01%	1.25	6.09%	1.81	8.72	3,030.00	0.5	2,741.18
2003	Surface	Phased Released	-	-	1.05%	1.25	6.01%	-	-	3,030.00	0.5	-
2004	Surface	Phased Released	470.13	437.09	1.09%	1.08	5.93%	5.10	25.90	3,030.00	0.5	7,727.79
2005	Surface	Phased Released	51.50	47.82	1.12%	1.25	5.82%	0.67	2.78	3,030.00	0.5	1,015.15
2006	Surface	Phased Released	60.78	56.49	1.16%	1.25	5.71%	0.82	3.22	3,030.00	0.5	1,235.68
2007	Surface	Phased Released	186.68	175.29	1.19%	0.55	5.58%	1.14	9.77	3,030.00	0.5	1,734.67
2008	Surface	Phased Released	-	-	1.22%	-	5.43%	-	-	3,030.00	0.5	-
2009	Surface	Phased Released	220.84	207.03	1.25%	0.90	5.28%	2.32	10.92	3,030.00	0.5	3,522.08
2010	Surface	Phased Released	-	-	1.27%	-	5.10%	-	-	3,030.00	0.5	-
2011	Surface	Phased Released	214.01	200.36	1.30%	1.25	4.92%	3.26	9.86	3,030.00	0.5	4,933.10
2012	Surface	Phased Released	-	-	1.32%	-	4.72%	-	-	3,030.00	0.5	-
2013	Surface	Phased Released	-	-	1.34%	-	4.51%	-	-	3,030.00	0.5	-
2014	Surface	Phased Released	27.91	26.30	1.36%	1.25	4.29%	0.45	1.13	3,030.00	0.5	678.45
2015	Surface	Phased Released	-	-	1.38%	-	4.06%	-	-	3,030.00	0.5	-
2016	Surface	Phased Released	-	-	1.39%	-	3.82%	-	-	3,030.00	0.5	-
2017	Surface	Phased Released	-	-	1.38%	-	3.54%	-	-	3,030.00	0.5	-
2018	Surface	Phased Released	-	-	1.35%	-	3.22%	-	-	3,030.00	0.5	-
2019	Surface	Phased Released	-	-	1.28%	-	2.83%	-	-	3,030.00	0.5	-
2020	Surface	Phased Released	-	-	1.15%	-	2.36%	-	-	3,030.00	0.5	-
2021	Surface	Phased Released	-	-	0.96%	-	1.80%	-	-	3,030.00	0.5	-
2022	Surface	Phased Released	-	-	0.69%	-	1.13%	-	-	3,030.00	0.5	-
2023	Surface	Phased Released	-	-	0.33%	-	0.33%	-	-	3,030.00	0.5	-

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Water Capital Cost Projection - Deterministic Model

				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Underground	Active	-	-	0.10%	-	0.59%	-	-	5,165.00	1	-
1966	Underground	Active	-	-	0.10%	-	0.59%	-	-	5,165.00	1	-
1967	Underground	Active	-	-	0.10%	-	0.62%	-	-	5,165.00	1	-
1968	Underground	Active	-	-	0.11%	-	0.64%	-	-	5,165.00	1	-
1969	Underground	Active	-	-	0.11%	-	0.67%	-	-	5,165.00	1	-
1970	Underground	Active	-	-	0.11%	-	0.70%	-	-	5,165.00	1	-
1971	Underground	Active	-	-	0.12%	-	0.73%	-	-	5,165.00	1	-
1972	Underground	Active	-	-	0.12%	-	0.76%	-	-	5,165.00	1	-
1973	Underground	Active	-	-	0.12%	-	0.79%	-	-	5,165.00	1	-
1974	Underground	Active	-	-	0.12%	-	0.82%	-	-	5,165.00	1	-
1975	Underground	Active	-	-	0.13%	-	0.86%	-	-	5,165.00	1	-
1976	Underground	Active	-	-	0.13%	-	0.89%	-	-	5,165.00	1	-
1977	Underground	Active	-	-	0.13%	-	0.93%	-	-	5,165.00	1	-
1978	Underground	Active	-	-	0.14%	-	0.97%	-	-	5,165.00	1	-
1979	Underground	Active	755.59	745.53	0.14%	1.03	1.08%	1.08	8.02	5,165.00	1	5,596.14
1980	Underground	Active	222.16	218.97	0.14%	0.97	1.18%	0.31	2.59	5,165.00	1	1,585.71
1981	Underground	Active	720.89	709.54	0.15%	1.17	1.29%	1.23	9.15	5,165.00	1	6,343.68
1982	Underground	Active	80.68	79.34	0.15%	1.02	1.40%	0.12	1.11	5,165.00	1	633.45
1983	Underground	Active	7,126.06	7,001.03	0.16%	0.91	1.50%	9.96	105.24	5,165.00	1	51,431.97
1984	Underground	Active	2,930.46	2,875.35	0.16%	1.02	1.61%	4.71	46.26	5,165.00	1	24,312.49
1985	Underground	Active	49.00	48.01	0.16%	1.25	1.71%	0.10	0.82	5,165.00	1	508.46
1986	Underground	Active	252.11	246.80	0.17%	1.11	1.82%	0.46	4.48	5,165.00	1	2,380.64
1987	Underground	Active	203.45	198.95	0.17%	1.11	1.92%	0.38	3.81	5,165.00	1	1,968.35
1988	Underground	Active	179.01	174.88	0.18%	1.11	2.01%	0.34	3.52	5,165.00	1	1,774.49
1989	Underground	Active	124.25	121.23	0.18%	1.25	2.11%	0.28	2.56	5,165.00	1	1,420.79
1990	Underground	Active	131.40	128.13	0.19%	1.08	2.20%	0.26	2.82	5,165.00	1	1,324.51
1991	Underground	Active	35.30	34.38	0.19%	1.25	2.29%	0.08	0.79	5,165.00	1	423.82
1992	Underground	Active	1,073.06	1,044.71	0.20%	0.96	2.37%	1.96	24.76	5,165.00	1	10,127.80
1993	Underground	Active	974.28	947.66	0.20%	1.02	2.45%	1.94	23.21	5,165.00	1	9,996.01
1994	Underground	Active	756.33	735.15	0.21%	0.99	2.52%	1.50	18.55	5,165.00	1	7,725.13
1995	Underground	Active	273.19	265.32	0.21%	1.02	2.59%	0.57	6.88	5,165.00	1	2,943.95
1996	Underground	Active	242.74	235.56	0.22%	1.04	2.65%	0.55	6.25	5,165.00	1	2,834.51
1997	Underground	Active	239.17	231.92	0.24%	1.09	2.71%	0.60	6.29	5,165.00	1	3,084.14
1998	Underground	Active	558.33	541.24	0.25%	0.99	2.76%	1.33	14.94	5,165.00	1	6,869.84
1999	Underground	Active	117.00	113.28	0.26%	1.25	2.80%	0.37	3.18	5,165.00	1	1,908.08
2000	Underground	Active	281.79	272.85	0.27%	1.08	2.84%	0.80	7.75	5,165.00	1	4,129.83
2001	Underground	Active	224.71	217.67	0.28%	0.83	2.87%	0.51	6.24	5,165.00	1	2,649.45
2002	Underground	Active	265.26	256.63	0.29%	1.16	2.89%	0.88	7.41	5,165.00	1	4,542.70
2003	Underground	Active	998.12	965.54	0.31%	1.15	2.90%	3.40	27.98	5,165.00	1	17,572.72
2004	Underground	Active	460.97	446.14	0.32%	1.00	2.90%	1.41	12.94	5,165.00	1	7,259.65
2005	Underground	Active	325.84	315.44	0.32%	0.95	2.89%	0.97	9.12	5,165.00	1	5,019.31
2006	Underground	Active	433.77	420.19	0.33%	0.83	2.88%	1.16	12.08	5,165.00	1	5,996.24
2007	Underground	Active	594.07	575.10	0.34%	1.10	2.85%	2.16	16.38	5,165.00	1	11,176.10
2008	Underground	Active	107.24	103.80	0.35%	1.25	2.81%	0.45	2.92	5,165.00	1	2,331.40
2009	Underground	Active	344.39	333.98	0.35%	0.90	2.76%	1.06	9.22	5,165.00	1	5,498.46
2010	Underground	Active	241.30	233.94	0.36%	1.16	2.70%	0.98	6.32	5,165.00	1	5,051.03
2011	Underground	Active	201.31	195.34	0.36%	1.15	2.63%	0.82	5.13	5,165.00	1	4,224.50
2012	Underground	Active	220.12	213.88	0.37%	1.05	2.54%	0.83	5.44	5,165.00	1	4,264.10
2013	Underground	Active	495.72	482.26	0.37%	1.03	2.45%	1.83	11.79	5,165.00	1	9,449.15
2014	Underground	Active	752.00	732.41	0.37%	1.06	2.33%	2.88	17.10	5,165.00	1	14,883.80
2015	Underground	Active	157.00	153.08	0.37%	1.15	2.21%	0.65	3.38	5,165.00	1	3,380.14
2016	Underground	Active	135.36	132.14	0.37%	1.25	2.07%	0.61	2.74	5,165.00	1	3,146.81
2017	Underground	Active	161.03	157.50	0.36%	1.25	1.92%	0.72	3.03	5,165.00	1	3,697.36
2018	Underground	Active	52.55	51.51	0.35%	1.25	1.75%	0.23	0.90	5,165.00	1	1,167.95
2019	Underground	Active	149.13	146.61	0.33%	1.08	1.57%	0.52	2.31	5,165.00	1	2,675.71
2020	Underground	Active	126.64	124.79	0.29%	1.25	1.38%	0.46	1.72	5,165.00	1	2,361.43
2021	Underground	Active	76.97	76.09	0.24%	1.25	1.16%	0.23	0.88	5,165.00	1	1,186.28
2022	Underground	Active	43.22	42.88	0.17%	1.25	0.93%	0.09	0.40	5,165.00	1	473.06
2023	Underground	Active	69.14	68.85	0.08%	1.25	0.69%	0.07	0.47	5,165.00	1	348.09

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				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Underground	Inactive	-	-	0.23%	-	0.35%	-	-	5,165.00	1	-
1966	Underground	Inactive	-	-	0.23%	-	0.35%	-	-	5,165.00	1	-
1967	Underground	Inactive	-	-	0.24%	-	0.36%	-	-	5,165.00	1	-
1968	Underground	Inactive	-	-	0.24%	-	0.38%	-	-	5,165.00	1	-
1969	Underground	Inactive	-	-	0.25%	-	0.40%	-	-	5,165.00	1	-
1970	Underground	Inactive	-	-	0.26%	-	0.41%	-	-	5,165.00	1	-
1971	Underground	Inactive	-	-	0.26%	-	0.43%	-	-	5,165.00	1	-
1972	Underground	Inactive	-	-	0.27%	-	0.45%	-	-	5,165.00	1	-
1973	Underground	Inactive	-	-	0.28%	-	0.47%	-	-	5,165.00	1	-
1974	Underground	Inactive	-	-	0.28%	-	0.48%	-	-	5,165.00	1	-
1975	Underground	Inactive	-	-	0.29%	-	0.50%	-	-	5,165.00	1	-
1976	Underground	Inactive	26.50	26.31	0.30%	0.55	0.53%	0.04	0.14	5,165.00	1	223.14
1977	Underground	Inactive	-	-	0.31%	-	0.55%	-	-	5,165.00	1	-
1978	Underground	Inactive	117.89	116.93	0.31%	0.55	0.57%	0.20	0.67	5,165.00	1	1,043.27
1979	Underground	Inactive	-	-	0.32%	-	0.63%	-	-	5,165.00	1	-
1980	Underground	Inactive	-	-	0.33%	-	0.70%	-	-	5,165.00	1	-
1981	Underground	Inactive	189.58	187.54	0.34%	0.73	0.76%	0.46	1.42	5,165.00	1	2,379.67
1982	Underground	Inactive	72.51	71.73	0.35%	0.55	0.82%	0.14	0.59	5,165.00	1	708.13
1983	Underground	Inactive	285.25	281.73	0.36%	0.78	0.88%	0.79	2.49	5,165.00	1	4,063.04
1984	Underground	Inactive	-	-	0.37%	-	0.95%	-	-	5,165.00	1	-
1985	Underground	Inactive	220.21	217.10	0.37%	0.90	1.01%	0.73	2.19	5,165.00	1	3,784.00
1986	Underground	Inactive	43.54	42.95	0.38%	0.55	1.07%	0.09	0.46	5,165.00	1	469.28
1987	Underground	Inactive	40.89	40.31	0.39%	0.55	1.13%	0.09	0.45	5,165.00	1	451.73
1988	Underground	Inactive	73.42	72.15	0.40%	1.19	1.18%	0.35	0.85	5,165.00	1	1,796.44
1989	Underground	Inactive	193.50	190.54	0.41%	0.55	1.24%	0.43	2.36	5,165.00	1	2,245.93
1990	Underground	Inactive	47.64	46.78	0.43%	1.08	1.29%	0.21	0.61	5,165.00	1	1,105.25
1991	Underground	Inactive	362.42	355.72	0.44%	1.02	1.35%	1.58	4.79	5,165.00	1	8,152.90
1992	Underground	Inactive	9.00	8.82	0.45%	1.25	1.39%	0.05	0.12	5,165.00	1	254.88
1993	Underground	Inactive	35.86	35.18	0.46%	0.90	1.44%	0.15	0.51	5,165.00	1	750.77
1994	Underground	Inactive	100.78	98.98	0.47%	0.55	1.48%	0.26	1.47	5,165.00	1	1,324.06
1995	Underground	Inactive	182.46	178.99	0.48%	0.67	1.52%	0.58	2.73	5,165.00	1	2,976.75
1996	Underground	Inactive	55.21	53.96	0.51%	1.25	1.56%	0.35	0.84	5,165.00	1	1,783.67
1997	Underground	Inactive	282.76	276.53	0.54%	1.02	1.59%	1.52	4.41	5,165.00	1	7,851.13
1998	Underground	Inactive	72.14	70.56	0.57%	0.90	1.62%	0.36	1.15	5,165.00	1	1,865.80
1999	Underground	Inactive	606.66	592.33	0.60%	1.11	1.65%	3.92	9.77	5,165.00	1	20,251.00
2000	Underground	Inactive	256.24	249.98	0.62%	1.16	1.67%	1.81	4.18	5,165.00	1	9,352.52
2001	Underground	Inactive	6.00	5.85	0.65%	1.25	1.69%	0.05	0.10	5,165.00	1	245.01
2002	Underground	Inactive	47.21	46.11	0.67%	0.90	1.70%	0.28	0.78	5,165.00	1	1,444.31
2003	Underground	Inactive	212.02	207.24	0.70%	0.76	1.70%	1.10	3.53	5,165.00	1	5,675.07
2004	Underground	Inactive	180.23	176.43	0.72%	0.55	1.71%	0.70	3.01	5,165.00	1	3,609.09
2005	Underground	Inactive	124.90	121.73	0.74%	1.11	1.70%	1.00	2.07	5,165.00	1	5,173.14
2006	Underground	Inactive	160.75	156.78	0.76%	1.02	1.69%	1.21	2.65	5,165.00	1	6,264.09
2007	Underground	Inactive	107.80	105.35	0.78%	0.78	1.68%	0.64	1.76	5,165.00	1	3,319.75
2008	Underground	Inactive	79.05	76.97	0.80%	1.25	1.65%	0.76	1.27	5,165.00	1	3,951.15
2009	Underground	Inactive	111.36	108.54	0.81%	1.15	1.62%	1.01	1.76	5,165.00	1	5,218.99
2010	Underground	Inactive	161.54	157.47	0.82%	1.17	1.59%	1.52	2.50	5,165.00	1	7,836.23
2011	Underground	Inactive	129.26	126.08	0.83%	1.15	1.55%	1.21	1.95	5,165.00	1	6,232.22
2012	Underground	Inactive	32.84	32.21	0.84%	0.55	1.50%	0.15	0.48	5,165.00	1	768.96
2013	Underground	Inactive	44.71	43.62	0.85%	1.25	1.44%	0.46	0.63	5,165.00	1	2,382.43
2014	Underground	Inactive	12.00	11.72	0.85%	1.25	1.37%	0.12	0.16	5,165.00	1	642.32
2015	Underground	Inactive	16.83	16.45	0.85%	1.25	1.30%	0.17	0.21	5,165.00	1	902.30
2016	Underground	Inactive	13.42	13.13	0.84%	1.25	1.22%	0.14	0.16	5,165.00	1	714.62
2017	Underground	Inactive	-	-	0.83%	-	1.13%	-	-	5,165.00	1	-
2018	Underground	Inactive	37.86	37.15	0.80%	1.25	1.03%	0.37	0.38	5,165.00	1	1,925.67
2019	Underground	Inactive	-	-	0.75%	-	0.92%	-	-	5,165.00	1	-
2020	Underground	Inactive	-	-	0.67%	-	0.81%	-	-	5,165.00	1	-
2021	Underground	Inactive	-	-	0.55%	-	0.68%	-	-	5,165.00	1	-
2022	Underground	Inactive	-	-	0.39%	-	0.55%	-	-	5,165.00	1	-
2023	Underground	Inactive	-	-	0.18%	-	0.40%	-	-	5,165.00	1	-

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				2025								
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Underground	Phased Released	-	-	0.27%	-	1.61%	-	-	5,165.00	0.5	-
1966	Underground	Phased Released	-	-	0.27%	-	1.61%	-	-	5,165.00	0.5	-
1967	Underground	Phased Released	-	-	0.27%	-	1.68%	-	-	5,165.00	0.5	-
1968	Underground	Phased Released	-	-	0.28%	-	1.75%	-	-	5,165.00	0.5	-
1969	Underground	Phased Released	-	-	0.29%	-	1.82%	-	-	5,165.00	0.5	-
1970	Underground	Phased Released	-	-	0.30%	-	1.89%	-	-	5,165.00	0.5	-
1971	Underground	Phased Released	-	-	0.30%	-	1.97%	-	-	5,165.00	0.5	-
1972	Underground	Phased Released	-	-	0.31%	-	2.05%	-	-	5,165.00	0.5	-
1973	Underground	Phased Released	-	-	0.32%	-	2.14%	-	-	5,165.00	0.5	-
1974	Underground	Phased Released	-	-	0.33%	-	2.23%	-	-	5,165.00	0.5	-
1975	Underground	Phased Released	-	-	0.34%	-	2.32%	-	-	5,165.00	0.5	-
1976	Underground	Phased Released	-	-	0.35%	-	2.42%	-	-	5,165.00	0.5	-
1977	Underground	Phased Released	-	-	0.35%	-	2.52%	-	-	5,165.00	0.5	-
1978	Underground	Phased Released	10.58	10.22	0.36%	1.25	2.63%	0.05	0.27	5,165.00	0.5	119.84
1979	Underground	Phased Released	59.68	57.48	0.37%	1.25	2.91%	0.27	1.67	5,165.00	0.5	691.14
1980	Underground	Phased Released	87.19	83.72	0.38%	1.25	3.20%	0.40	2.68	5,165.00	0.5	1,032.38
1981	Underground	Phased Released	66.33	63.52	0.39%	1.13	3.49%	0.28	2.22	5,165.00	0.5	728.40
1982	Underground	Phased Released	194.36	185.45	0.40%	1.25	3.78%	0.93	7.01	5,165.00	0.5	2,405.67
1983	Underground	Phased Released	70.38	66.94	0.41%	1.25	4.07%	0.34	2.72	5,165.00	0.5	890.66
1984	Underground	Phased Released	80.60	76.67	0.42%	0.55	4.35%	0.18	3.34	5,165.00	0.5	460.35
1985	Underground	Phased Released	17.24	16.30	0.43%	1.25	4.63%	0.09	0.76	5,165.00	0.5	228.09
1986	Underground	Phased Released	118.96	112.12	0.44%	1.25	4.91%	0.62	5.51	5,165.00	0.5	1,609.35
1987	Underground	Phased Released	67.09	63.04	0.46%	1.25	5.18%	0.36	3.27	5,165.00	0.5	928.15
1988	Underground	Phased Released	197.49	185.04	0.47%	1.25	5.45%	1.08	10.08	5,165.00	0.5	2,794.11
1989	Underground	Phased Released	80.68	75.38	0.48%	1.25	5.70%	0.45	4.30	5,165.00	0.5	1,167.45
1990	Underground	Phased Released	18.31	17.06	0.49%	1.25	5.95%	0.10	1.02	5,165.00	0.5	271.01
1991	Underground	Phased Released	23.22	21.58	0.50%	1.25	6.19%	0.14	1.34	5,165.00	0.5	351.58
1992	Underground	Phased Released	39.95	37.04	0.52%	1.25	6.41%	0.24	2.38	5,165.00	0.5	618.86
1993	Underground	Phased Released	68.38	63.25	0.53%	1.25	6.63%	0.42	4.19	5,165.00	0.5	1,083.89
1994	Underground	Phased Released	18.79	17.34	0.54%	1.25	6.83%	0.12	1.18	5,165.00	0.5	304.81
1995	Underground	Phased Released	60.54	55.74	0.56%	1.25	7.01%	0.39	3.91	5,165.00	0.5	1,004.93
1996	Underground	Phased Released	133.37	122.54	0.59%	1.25	7.18%	0.91	8.80	5,165.00	0.5	2,341.99
1997	Underground	Phased Released	119.99	110.04	0.63%	1.25	7.34%	0.86	8.07	5,165.00	0.5	2,220.68
1998	Underground	Phased Released	64.00	58.59	0.66%	1.25	7.47%	0.48	4.38	5,165.00	0.5	1,243.99
1999	Underground	Phased Released	246.00	225.50	0.69%	0.90	7.59%	1.40	17.11	5,165.00	0.5	3,613.89
2000	Underground	Phased Released	59.65	54.46	0.72%	1.25	7.68%	0.49	4.18	5,165.00	0.5	1,266.63
2001	Underground	Phased Released	36.60	33.38	0.75%	1.25	7.76%	0.31	2.59	5,165.00	0.5	808.67
2002	Underground	Phased Released	48.55	44.25	0.78%	1.25	7.81%	0.43	3.46	5,165.00	0.5	1,113.04
2003	Underground	Phased Released	31.05	28.29	0.81%	1.25	7.84%	0.29	2.22	5,165.00	0.5	736.63
2004	Underground	Phased Released	-	-	0.83%	-	7.85%	-	-	5,165.00	0.5	-
2005	Underground	Phased Released	21.73	19.80	0.86%	1.25	7.83%	0.21	1.55	5,165.00	0.5	547.81
2006	Underground	Phased Released	-	-	0.88%	-	7.78%	-	-	5,165.00	0.5	-
2007	Underground	Phased Released	-	-	0.90%	-	7.71%	-	-	5,165.00	0.5	-
2008	Underground	Phased Released	63.64	58.14	0.92%	1.25	7.60%	0.67	4.42	5,165.00	0.5	1,725.57
2009	Underground	Phased Released	54.60	49.96	0.94%	1.25	7.47%	0.58	3.73	5,165.00	0.5	1,509.67
2010	Underground	Phased Released	-	-	0.95%	-	7.31%	-	-	5,165.00	0.5	-
2011	Underground	Phased Released	25.60	23.53	0.96%	1.25	7.11%	0.28	1.67	5,165.00	0.5	730.84
2012	Underground	Phased Released	-	-	0.97%	-	6.88%	-	-	5,165.00	0.5	-
2013	Underground	Phased Released	-	-	0.98%	-	6.62%	-	-	5,165.00	0.5	-
2014	Underground	Phased Released	-	-	0.98%	-	6.32%	-	-	5,165.00	0.5	-
2015	Underground	Phased Released	-	-	0.98%	-	5.98%	-	-	5,165.00	0.5	-
2016	Underground	Phased Released	-	-	0.97%	-	5.61%	-	-	5,165.00	0.5	-
2017	Underground	Phased Released	-	-	0.96%	-	5.20%	-	-	5,165.00	0.5	-
2018	Underground	Phased Released	-	-	0.93%	-	4.75%	-	-	5,165.00	0.5	-
2019	Underground	Phased Released	-	-	0.87%	-	4.25%	-	-	5,165.00	0.5	-
2020	Underground	Phased Released	-	-	0.77%	-	3.72%	-	-	5,165.00	0.5	-
2021	Underground	Phased Released	-	-	0.64%	-	3.14%	-	-	5,165.00	0.5	-
2022	Underground	Phased Released	-	-	0.45%	-	2.52%	-	-	5,165.00	0.5	-
2023	Underground	Phased Released	-	-	0.21%	-	1.86%	-	-	5,165.00	0.5	-

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				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Other	Active	-	-	0.15%	-	1.97%	-	-	13,035.00	1	-
1966	Other	Active	-	-	0.15%	-	1.97%	-	-	13,035.00	1	-
1967	Other	Active	-	-	0.15%	-	2.01%	-	-	13,035.00	1	-
1968	Other	Active	-	-	0.15%	-	2.06%	-	-	13,035.00	1	-
1969	Other	Active	-	-	0.16%	-	2.10%	-	-	13,035.00	1	-
1970	Other	Active	-	-	0.16%	-	2.14%	-	-	13,035.00	1	-
1971	Other	Active	-	-	0.17%	-	2.18%	-	-	13,035.00	1	-
1972	Other	Active	20.00	19.50	0.17%	1.25	2.23%	0.04	0.43	13,035.00	1	541.67
1973	Other	Active	-	-	0.17%	-	2.27%	-	-	13,035.00	1	-
1974	Other	Active	28.52	27.78	0.18%	1.25	2.32%	0.06	0.64	13,035.00	1	811.66
1975	Other	Active	6.20	6.04	0.18%	1.25	2.37%	0.01	0.14	13,035.00	1	180.87
1976	Other	Active	-	-	0.19%	-	2.42%	-	-	13,035.00	1	-
1977	Other	Active	223.99	217.88	0.19%	1.08	2.47%	0.45	5.37	13,035.00	1	5,906.78
1978	Other	Active	-	-	0.20%	-	2.52%	-	-	13,035.00	1	-
1979	Other	Active	65.00	63.16	0.20%	1.25	2.57%	0.16	1.62	13,035.00	1	2,094.48
1980	Other	Active	364.74	354.65	0.21%	1.05	2.57%	0.78	9.11	13,035.00	1	10,132.42
1981	Other	Active	5,211.96	5,072.15	0.21%	0.91	2.54%	9.87	128.86	13,035.00	1	128,698.02
1982	Other	Active	586.43	571.17	0.22%	0.90	2.48%	1.13	14.18	13,035.00	1	14,713.48
1983	Other	Active	3,861.09	3,764.75	0.23%	0.86	2.40%	7.30	90.36	13,035.00	1	95,170.36
1984	Other	Active	4,421.79	4,317.64	0.23%	0.76	2.30%	7.62	99.14	13,035.00	1	99,388.07
1985	Other	Active	1,543.19	1,507.86	0.24%	1.03	2.17%	3.70	32.79	13,035.00	1	48,176.63
1986	Other	Active	1,384.69	1,355.21	0.24%	0.95	2.04%	3.14	27.62	13,035.00	1	40,942.88
1987	Other	Active	974.10	954.69	0.25%	1.00	1.89%	2.38	18.05	13,035.00	1	31,013.60
1988	Other	Active	618.27	606.80	0.26%	1.06	1.74%	1.64	10.54	13,035.00	1	21,340.81
1989	Other	Active	290.43	285.41	0.26%	1.15	1.58%	0.86	4.50	13,035.00	1	11,216.17
1990	Other	Active	344.46	339.19	0.27%	0.97	1.42%	0.88	4.81	13,035.00	1	11,531.42
1991	Other	Active	491.29	484.16	0.28%	1.19	1.26%	1.59	6.12	13,035.00	1	20,740.09
1992	Other	Active	391.14	386.14	0.28%	1.04	1.11%	1.14	4.30	13,035.00	1	14,806.30
1993	Other	Active	946.05	935.77	0.29%	0.80	0.98%	2.16	9.13	13,035.00	1	28,131.63
1994	Other	Active	2,315.41	2,292.06	0.30%	0.87	0.85%	5.95	19.49	13,035.00	1	77,612.84
1995	Other	Active	950.69	941.27	0.31%	1.08	0.74%	3.09	6.98	13,035.00	1	40,250.72
1996	Other	Active	1,971.02	1,954.42	0.31%	0.78	0.65%	4.79	12.79	13,035.00	1	62,461.28
1997	Other	Active	1,403.71	1,391.77	0.32%	0.90	0.59%	4.02	8.22	13,035.00	1	52,414.35
1998	Other	Active	1,144.42	1,134.11	0.33%	1.04	0.55%	3.88	6.29	13,035.00	1	50,620.48
1999	Other	Active	404.95	401.25	0.34%	0.97	0.55%	1.31	2.20	13,035.00	1	17,132.22
2000	Other	Active	222.50	220.35	0.35%	0.90	0.58%	0.69	1.28	13,035.00	1	8,953.31
2001	Other	Active	381.08	377.05	0.36%	0.83	0.65%	1.11	2.44	13,035.00	1	14,490.99
2002	Other	Active	818.79	807.79	0.36%	1.16	0.76%	3.42	6.10	13,035.00	1	44,597.17
2003	Other	Active	908.39	894.34	0.37%	1.13	0.91%	3.79	8.13	13,035.00	1	49,371.30
2004	Other	Active	1,149.70	1,128.82	0.38%	0.99	1.11%	4.27	12.55	13,035.00	1	55,689.33
2005	Other	Active	23.99	23.47	0.45%	0.90	1.37%	0.10	0.32	13,035.00	1	1,252.23
2006	Other	Active	491.96	478.82	0.54%	1.00	1.68%	2.56	8.03	13,035.00	1	33,406.97
2007	Other	Active	394.47	381.62	0.63%	1.08	2.05%	2.56	7.81	13,035.00	1	33,432.98
2008	Other	Active	599.63	576.28	0.73%	1.10	2.48%	4.60	14.28	13,035.00	1	59,913.94
2009	Other	Active	174.78	166.79	0.84%	1.08	2.98%	1.50	4.96	13,035.00	1	19,523.92
2010	Other	Active	1,066.83	1,010.90	0.96%	0.98	3.54%	9.45	35.81	13,035.00	1	123,235.60
2011	Other	Active	365.79	343.90	1.08%	0.90	4.18%	3.36	14.38	13,035.00	1	43,742.66
2012	Other	Active	213.57	198.17	1.21%	1.16	4.90%	2.78	9.71	13,035.00	1	36,232.23
2013	Other	Active	2,100.30	1,933.76	1.30%	1.00	5.70%	25.14	110.13	13,035.00	1	327,759.26
2014	Other	Active	282.83	256.89	1.36%	1.21	6.58%	4.21	16.89	13,035.00	1	54,856.81
2015	Other	Active	1,105.29	992.54	1.35%	1.13	7.54%	15.20	74.86	13,035.00	1	198,096.65
2016	Other	Active	1,513.50	1,321.30	1.26%	1.13	8.77%	18.94	115.85	13,035.00	1	246,820.54
2017	Other	Active	385.95	319.30	1.10%	1.13	11.45%	3.98	36.57	13,035.00	1	51,907.12
2018	Other	Active	21.89	16.91	0.86%	1.25	16.29%	0.18	2.75	13,035.00	1	2,372.19
2019	Other	Active	6.47	4.72	0.60%	1.25	22.01%	0.04	1.04	13,035.00	1	457.90
2020	Other	Active	563.58	402.48	0.34%	1.13	26.67%	1.56	107.34	13,035.00	1	20,274.46
2021	Other	Active	122.97	91.90	0.19%	1.25	28.37%	0.21	26.07	13,035.00	1	2,799.22
2022	Other	Active	605.48	512.56	0.03%	1.21	25.23%	0.20	129.31	13,035.00	1	2,662.71
2023	Other	Active	863.80	863.80	0.00%	1.25	15.35%	-	132.56	13,035.00	1	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Other	Inactive	-	-	0.33%	-	1.16%	-	-	13,035.00	1	-
1966	Other	Inactive	-	-	0.33%	-	1.16%	-	-	13,035.00	1	-
1967	Other	Inactive	-	-	0.34%	-	1.19%	-	-	13,035.00	1	-
1968	Other	Inactive	-	-	0.35%	-	1.21%	-	-	13,035.00	1	-
1969	Other	Inactive	-	-	0.36%	-	1.23%	-	-	13,035.00	1	-
1970	Other	Inactive	-	-	0.37%	-	1.26%	-	-	13,035.00	1	-
1971	Other	Inactive	-	-	0.38%	-	1.29%	-	-	13,035.00	1	-
1972	Other	Inactive	-	-	0.39%	-	1.31%	-	-	13,035.00	1	-
1973	Other	Inactive	-	-	0.40%	-	1.34%	-	-	13,035.00	1	-
1974	Other	Inactive	-	-	0.41%	-	1.37%	-	-	13,035.00	1	-
1975	Other	Inactive	-	-	0.42%	-	1.39%	-	-	13,035.00	1	-
1976	Other	Inactive	14.48	14.19	0.43%	1.25	1.42%	0.08	0.20	13,035.00	1	996.90
1977	Other	Inactive	-	-	0.44%	-	1.45%	-	-	13,035.00	1	-
1978	Other	Inactive	-	-	0.45%	-	1.48%	-	-	13,035.00	1	-
1979	Other	Inactive	7.25	7.10	0.47%	1.25	1.51%	0.04	0.11	13,035.00	1	537.95
1980	Other	Inactive	114.75	112.73	0.48%	0.55	1.51%	0.30	1.70	13,035.00	1	3,855.93
1981	Other	Inactive	707.84	694.10	0.49%	0.96	1.49%	3.26	10.37	13,035.00	1	42,430.12
1982	Other	Inactive	127.20	124.81	0.50%	0.90	1.46%	0.56	1.82	13,035.00	1	7,349.22
1983	Other	Inactive	1,078.40	1,058.43	0.51%	0.95	1.41%	5.18	14.94	13,035.00	1	67,470.16
1984	Other	Inactive	440.78	432.99	0.53%	0.90	1.35%	2.06	5.85	13,035.00	1	26,819.33
1985	Other	Inactive	1,198.15	1,177.21	0.54%	0.99	1.28%	6.30	15.06	13,035.00	1	82,056.20
1986	Other	Inactive	-	-	0.56%	-	1.20%	-	-	13,035.00	1	-
1987	Other	Inactive	-	-	0.57%	-	1.11%	-	-	13,035.00	1	-
1988	Other	Inactive	29.83	29.33	0.58%	1.25	1.02%	0.21	0.30	13,035.00	1	2,792.04
1989	Other	Inactive	414.41	408.21	0.60%	1.08	0.93%	2.63	3.79	13,035.00	1	34,276.34
1990	Other	Inactive	481.66	474.64	0.61%	1.13	0.83%	3.31	3.96	13,035.00	1	43,093.94
1991	Other	Inactive	-	-	0.63%	-	0.74%	-	-	13,035.00	1	-
1992	Other	Inactive	332.18	327.78	0.65%	1.13	0.66%	2.40	2.15	13,035.00	1	31,305.64
1993	Other	Inactive	163.11	161.17	0.66%	1.02	0.57%	1.09	0.93	13,035.00	1	14,162.33
1994	Other	Inactive	395.55	390.86	0.68%	1.08	0.50%	2.86	1.96	13,035.00	1	37,248.09
1995	Other	Inactive	641.22	633.55	0.70%	1.13	0.44%	5.01	2.77	13,035.00	1	65,284.96
1996	Other	Inactive	152.16	151.02	0.72%	0.55	0.38%	0.59	0.58	13,035.00	1	7,745.64
1997	Other	Inactive	5.95	5.91	0.73%	0.55	0.35%	0.02	0.02	13,035.00	1	310.68
1998	Other	Inactive	117.09	116.21	0.75%	0.55	0.33%	0.48	0.38	13,035.00	1	6,270.20
1999	Other	Inactive	-	-	0.77%	-	0.32%	-	-	13,035.00	1	-
2000	Other	Inactive	116.73	115.76	0.79%	0.55	0.34%	0.50	0.39	13,035.00	1	6,570.35
2001	Other	Inactive	144.00	142.70	0.81%	0.55	0.38%	0.64	0.54	13,035.00	1	8,306.78
2002	Other	Inactive	-	-	0.83%	-	0.44%	-	-	13,035.00	1	-
2003	Other	Inactive	-	-	0.85%	-	0.54%	-	-	13,035.00	1	-
2004	Other	Inactive	56.00	54.82	0.88%	1.25	0.65%	0.60	0.36	13,035.00	1	7,825.23
2005	Other	Inactive	50.69	49.41	1.04%	1.25	0.80%	0.64	0.40	13,035.00	1	8,369.07
2006	Other	Inactive	-	-	1.22%	-	0.99%	-	-	13,035.00	1	-
2007	Other	Inactive	-	-	1.43%	-	1.20%	-	-	13,035.00	1	-
2008	Other	Inactive	-	-	1.66%	-	1.46%	-	-	13,035.00	1	-
2009	Other	Inactive	19.80	18.85	1.91%	1.25	1.75%	0.45	0.33	13,035.00	1	5,863.31
2010	Other	Inactive	-	-	2.19%	-	2.08%	-	-	13,035.00	1	-
2011	Other	Inactive	-	-	2.48%	-	2.46%	-	-	13,035.00	1	-
2012	Other	Inactive	-	-	2.76%	-	2.88%	-	-	13,035.00	1	-
2013	Other	Inactive	-	-	2.98%	-	3.35%	-	-	13,035.00	1	-
2014	Other	Inactive	-	-	3.10%	-	3.87%	-	-	13,035.00	1	-
2015	Other	Inactive	-	-	3.09%	-	4.44%	-	-	13,035.00	1	-
2016	Other	Inactive	-	-	2.89%	-	5.16%	-	-	13,035.00	1	-
2017	Other	Inactive	-	-	2.52%	-	6.74%	-	-	13,035.00	1	-
2018	Other	Inactive	11.88	10.14	1.97%	1.25	9.58%	0.25	0.97	13,035.00	1	3,251.51
2019	Other	Inactive	-	-	1.36%	-	12.95%	-	-	13,035.00	1	-
2020	Other	Inactive	-	-	0.78%	-	15.69%	-	-	13,035.00	1	-
2021	Other	Inactive	-	-	0.43%	-	16.69%	-	-	13,035.00	1	-
2022	Other	Inactive	-	-	0.08%	-	14.84%	-	-	13,035.00	1	-
2023	Other	Inactive	-	-	0.00%	-	9.03%	-	-	13,035.00	1	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Capital Cost Projection - Deterministic Model

				2025								
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Other	Phased Released	-	-	0.39%	-	5.34%	-	-	13,035.00	0.5	-
1966	Other	Phased Released	-	-	0.39%	-	5.34%	-	-	13,035.00	0.5	-
1967	Other	Phased Released	-	-	0.40%	-	5.45%	-	-	13,035.00	0.5	-
1968	Other	Phased Released	-	-	0.41%	-	5.56%	-	-	13,035.00	0.5	-
1969	Other	Phased Released	-	-	0.42%	-	5.68%	-	-	13,035.00	0.5	-
1970	Other	Phased Released	-	-	0.43%	-	5.79%	-	-	13,035.00	0.5	-
1971	Other	Phased Released	-	-	0.44%	-	5.91%	-	-	13,035.00	0.5	-
1972	Other	Phased Released	-	-	0.45%	-	6.03%	-	-	13,035.00	0.5	-
1973	Other	Phased Released	9.00	8.38	0.46%	1.25	6.15%	0.05	0.52	13,035.00	0.5	315.52
1974	Other	Phased Released	-	-	0.47%	-	6.28%	-	-	13,035.00	0.5	-
1975	Other	Phased Released	-	-	0.49%	-	6.41%	-	-	13,035.00	0.5	-
1976	Other	Phased Released	27.88	25.84	0.50%	1.25	6.54%	0.16	1.69	13,035.00	0.5	1,049.56
1977	Other	Phased Released	-	-	0.51%	-	6.67%	-	-	13,035.00	0.5	-
1978	Other	Phased Released	12.76	11.79	0.52%	1.25	6.81%	0.08	0.80	13,035.00	0.5	503.63
1979	Other	Phased Released	58.69	54.20	0.54%	1.25	6.95%	0.36	3.77	13,035.00	0.5	2,375.24
1980	Other	Phased Released	7.91	7.31	0.55%	1.25	6.95%	0.05	0.51	13,035.00	0.5	328.55
1981	Other	Phased Released	475.54	440.63	0.57%	1.08	6.87%	2.68	30.29	13,035.00	0.5	17,467.76
1982	Other	Phased Released	201.26	186.69	0.58%	1.25	6.72%	1.35	12.54	13,035.00	0.5	8,826.51
1983	Other	Phased Released	158.90	148.04	0.60%	1.02	6.49%	0.90	9.61	13,035.00	0.5	5,838.63
1984	Other	Phased Released	75.79	70.74	0.61%	1.25	6.21%	0.54	4.40	13,035.00	0.5	3,518.09
1985	Other	Phased Released	43.00	40.28	0.63%	1.25	5.88%	0.32	2.37	13,035.00	0.5	2,054.84
1986	Other	Phased Released	-	-	0.64%	-	5.51%	-	-	13,035.00	0.5	-
1987	Other	Phased Released	-	-	0.66%	-	5.12%	-	-	13,035.00	0.5	-
1988	Other	Phased Released	-	-	0.68%	-	4.70%	-	-	13,035.00	0.5	-
1989	Other	Phased Released	62.20	59.26	0.69%	1.25	4.27%	0.51	2.53	13,035.00	0.5	3,344.90
1990	Other	Phased Released	-	-	0.71%	-	3.84%	-	-	13,035.00	0.5	-
1991	Other	Phased Released	-	-	0.73%	-	3.42%	-	-	13,035.00	0.5	-
1992	Other	Phased Released	-	-	0.75%	-	3.02%	-	-	13,035.00	0.5	-
1993	Other	Phased Released	-	-	0.77%	-	2.64%	-	-	13,035.00	0.5	-
1994	Other	Phased Released	-	-	0.79%	-	2.30%	-	-	13,035.00	0.5	-
1995	Other	Phased Released	-	-	0.81%	-	2.01%	-	-	13,035.00	0.5	-
1996	Other	Phased Released	-	-	0.83%	-	1.77%	-	-	13,035.00	0.5	-
1997	Other	Phased Released	31.16	30.35	0.85%	1.25	1.60%	0.32	0.49	13,035.00	0.5	2,097.99
1998	Other	Phased Released	-	-	0.87%	-	1.50%	-	-	13,035.00	0.5	-
1999	Other	Phased Released	179.00	175.29	0.89%	0.55	1.49%	0.86	2.61	13,035.00	0.5	5,607.99
2000	Other	Phased Released	-	-	0.92%	-	1.57%	-	-	13,035.00	0.5	-
2001	Other	Phased Released	-	-	0.94%	-	1.75%	-	-	13,035.00	0.5	-
2002	Other	Phased Released	-	-	0.96%	-	2.04%	-	-	13,035.00	0.5	-
2003	Other	Phased Released	-	-	0.99%	-	2.46%	-	-	13,035.00	0.5	-
2004	Other	Phased Released	-	-	1.01%	-	3.01%	-	-	13,035.00	0.5	-
2005	Other	Phased Released	-	-	1.20%	-	3.70%	-	-	13,035.00	0.5	-
2006	Other	Phased Released	-	-	1.41%	-	4.54%	-	-	13,035.00	0.5	-
2007	Other	Phased Released	-	-	1.65%	-	5.54%	-	-	13,035.00	0.5	-
2008	Other	Phased Released	9.90	8.83	1.92%	1.25	6.70%	0.21	0.59	13,035.00	0.5	1,378.50
2009	Other	Phased Released	-	-	2.21%	-	8.05%	-	-	13,035.00	0.5	-
2010	Other	Phased Released	-	-	2.53%	-	9.58%	-	-	13,035.00	0.5	-
2011	Other	Phased Released	-	-	2.87%	-	11.32%	-	-	13,035.00	0.5	-
2012	Other	Phased Released	-	-	3.19%	-	13.26%	-	-	13,035.00	0.5	-
2013	Other	Phased Released	-	-	3.45%	-	15.41%	-	-	13,035.00	0.5	-
2014	Other	Phased Released	-	-	3.59%	-	17.79%	-	-	13,035.00	0.5	-
2015	Other	Phased Released	115.00	82.91	3.57%	1.25	20.41%	3.70	16.92	13,035.00	0.5	24,118.31
2016	Other	Phased Released	-	-	3.34%	-	23.72%	-	-	13,035.00	0.5	-
2017	Other	Phased Released	-	-	2.91%	-	30.99%	-	-	13,035.00	0.5	-
2018	Other	Phased Released	-	-	2.28%	-	44.09%	-	-	13,035.00	0.5	-
2019	Other	Phased Released	-	-	1.58%	-	59.57%	-	-	13,035.00	0.5	-
2020	Other	Phased Released	-	-	0.90%	-	72.17%	-	-	13,035.00	0.5	-
2021	Other	Phased Released	-	-	0.49%	-	76.77%	-	-	13,035.00	0.5	-

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water O&M Cost Projection - Deterministic Model
Water O&M Total - All Mine Types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Incremental Yearly Liability				Incremental Yearly Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	88,372	21,931	12,683	122,986	0	0	0	0
2025	85,290	20,936	11,286	117,512	0	0	0	0
2026	81,888	19,943	10,051	111,882	0	0	0	0
2027	78,034	18,963	8,969	105,966	44,186	10,965	6,342	61,493
2028	73,880	17,984	8,019	99,882	86,831	21,434	11,984	120,249
2029	69,686	17,041	7,186	93,912	83,589	20,440	10,668	114,697
2030	65,554	16,149	6,459	88,162	79,961	19,453	9,510	108,924
2031	61,543	15,300	5,820	82,663	112,897	27,465	12,503	152,865
2032	57,743	14,488	5,257	77,487	69,686	17,041	7,186	93,912
2033	54,141	13,712	4,757	72,610	65,554	16,149	6,459	88,162
2034	50,747	12,968	4,316	68,031	61,543	15,300	5,820	82,663
2035	47,640	12,258	3,923	63,820	57,743	14,488	5,257	77,487
2036	44,704	11,591	3,576	59,871	54,141	13,712	4,757	72,610
2037	41,972	10,962	3,271	56,204	50,747	12,968	4,316	68,031
2038	39,450	10,367	2,998	52,815	47,640	12,258	3,923	63,820
2039	37,085	9,802	2,756	49,643	44,704	11,591	3,576	59,871
2040	34,860	9,270	2,541	46,672	41,972	10,962	3,271	56,204
2041	32,790	8,779	2,357	43,925	39,450	10,367	2,998	52,815
2042	30,846	8,319	2,192	41,356	37,085	9,802	2,756	49,643
2043	29,044	7,895	2,045	38,984	34,860	9,270	2,541	46,672

Notes: Col (1) - (3) from Exhibit E-121, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Col (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water O&M Cost Projection - Deterministic Model
Surface Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Incremental Yearly Liability				Incremental Yearly Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	56,305	13,011	8,847	78,164	0	0	0	0
2025	55,177	12,433	7,907	75,517	0	0	0	0
2026	53,693	11,830	7,072	72,594	0	0	0	0
2027	51,796	11,220	6,331	69,346	28,153	6,506	4,424	39,082
2028	49,595	10,596	5,670	65,861	55,741	12,722	8,377	76,840
2029	47,223	9,998	5,084	62,305	54,435	12,131	7,489	74,056
2030	44,764	9,426	4,565	58,755	52,744	11,525	6,701	70,970
2031	42,288	8,877	4,105	55,270	75,493	16,206	8,835	100,534
2032	39,841	8,354	3,696	51,891	47,223	9,998	5,084	62,305
2033	37,470	7,856	3,333	48,659	44,764	9,426	4,565	58,755
2034	35,196	7,375	3,011	45,582	42,288	8,877	4,105	55,270
2035	33,028	6,916	2,724	42,668	39,841	8,354	3,696	51,891
2036	30,949	6,486	2,472	39,907	37,470	7,856	3,333	48,659
2037	28,964	6,081	2,249	37,294	35,196	7,375	3,011	45,582
2038	27,083	5,698	2,050	34,831	33,028	6,916	2,724	42,668
2039	25,306	5,334	1,874	32,513	30,949	6,486	2,472	39,907
2040	23,631	4,990	1,718	30,339	28,964	6,081	2,249	37,294
2041	22,063	4,669	1,584	28,316	27,083	5,698	2,050	34,831
2042	20,587	4,367	1,464	26,418	25,306	5,334	1,874	32,513
2043	19,200	4,085	1,357	24,641	23,631	4,990	1,718	30,339

Notes: Col (1) - (3) from Exhibit E-121, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Col (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water O&M Cost Projection - Deterministic Model
Underground Mines

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Incremental Yearly Liability				Incremental Yearly Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	7,289	3,549	2,011	12,850	0	0	0	0
2025	6,996	3,375	1,806	12,178	0	0	0	0
2026	6,703	3,205	1,625	11,533	0	0	0	0
2027	6,408	3,039	1,466	10,913	3,645	1,775	1,006	6,425
2028	6,116	2,882	1,328	10,326	7,143	3,462	1,909	12,514
2029	5,832	2,730	1,207	9,769	6,850	3,290	1,715	11,855
2030	5,556	2,596	1,102	9,254	6,555	3,122	1,546	11,223
2031	5,291	2,471	1,010	8,772	9,320	4,401	2,062	15,782
2032	5,035	2,352	928	8,314	5,832	2,730	1,207	9,769
2033	4,790	2,237	855	7,882	5,556	2,596	1,102	9,254
2034	4,563	2,129	791	7,483	5,291	2,471	1,010	8,772
2035	4,348	2,028	733	7,109	5,035	2,352	928	8,314
2036	4,145	1,933	681	6,759	4,790	2,237	855	7,882
2037	3,952	1,845	635	6,432	4,563	2,129	791	7,483
2038	3,773	1,763	593	6,128	4,348	2,028	733	7,109
2039	3,604	1,685	556	5,846	4,145	1,933	681	6,759
2040	3,446	1,614	524	5,584	3,952	1,845	635	6,432
2041	3,300	1,550	495	5,344	3,773	1,763	593	6,128
2042	3,162	1,491	470	5,123	3,604	1,685	556	5,846
2043	3,050	1,437	447	4,935	3,446	1,614	524	5,584

Notes: Col (1) - (3) from Exhibit E-121, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Col (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water O&M Cost Projection - Deterministic Model
Other

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fiscal Year	Incremental Yearly Liability				Incremental Yearly Liability - Three Year Delay			
Ending 6/30	Active	Inactive	Phase Released	Total	Active	Inactive	Phase Released	Total
2024	24,778	5,370	1,825	31,972	0	0	0	0
2025	23,117	5,128	1,572	29,817	0	0	0	0
2026	21,492	4,908	1,355	27,755	0	0	0	0
2027	19,830	4,704	1,172	25,707	12,389	2,685	912	15,986
2028	18,169	4,506	1,021	23,695	23,947	5,249	1,699	30,895
2029	16,631	4,314	895	21,839	22,305	5,018	1,464	28,786
2030	15,234	4,127	792	20,153	20,661	4,806	1,264	26,731
2031	13,965	3,951	706	18,622	28,084	6,858	1,607	36,549
2032	12,867	3,782	633	17,281	16,631	4,314	895	21,839
2033	11,881	3,619	569	16,069	15,234	4,127	792	20,153
2034	10,989	3,463	514	14,966	13,965	3,951	706	18,622
2035	10,264	3,314	465	14,044	12,867	3,782	633	17,281
2036	9,611	3,172	422	13,205	11,881	3,619	569	16,069
2037	9,055	3,036	387	12,478	10,989	3,463	514	14,966
2038	8,595	2,906	355	11,856	10,264	3,314	465	14,044
2039	8,175	2,783	326	11,284	9,611	3,172	422	13,205
2040	7,782	2,666	300	10,748	9,055	3,036	387	12,478
2041	7,426	2,560	278	10,264	8,595	2,906	355	11,856
2042	7,097	2,461	258	9,816	8,175	2,783	326	11,284
2043	6,794	2,373	241	9,409	7,782	2,666	300	10,748

Notes: Col (1) - (3) from Exhibit E-121, Col (12), (21), etc.
Col (4) = (1) + (2) + (3)
Col (5) - (8) based on (1) - (4) with a three-year delay

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Water Operations & Maintenance Cost Projection - Deterministic Model

				2024								
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Surface	Active	-	0.060%	0.00	0.821%	-	-	80.00	1.00	-
1966	Surface	Active	-	0.064%	0.00	0.855%	-	-	80.00	1.00	-
1967	Surface	Active	-	0.067%	0.00	0.891%	-	-	80.00	1.00	-
1968	Surface	Active	-	0.070%	0.00	0.928%	-	-	80.00	1.00	-
1969	Surface	Active	-	0.074%	0.00	0.967%	-	-	80.00	1.00	-
1970	Surface	Active	-	0.078%	0.00	1.007%	-	-	80.00	1.00	-
1971	Surface	Active	-	0.082%	0.00	1.049%	-	-	80.00	1.00	-
1972	Surface	Active	400.00	0.086%	1.25	1.092%	0.43	4.37	80.00	1.00	34.57
1973	Surface	Active	-	0.091%	0.00	1.138%	-	-	80.00	1.00	-
1974	Surface	Active	-	0.096%	0.00	1.185%	-	-	80.00	1.00	-
1975	Surface	Active	-	0.101%	0.00	1.235%	-	-	80.00	1.00	-
1976	Surface	Active	-	0.106%	0.00	1.286%	-	-	80.00	1.00	-
1977	Surface	Active	1,504.07	0.112%	1.02	1.340%	1.71	20.15	80.00	1.00	136.64
1978	Surface	Active	2,061.88	0.118%	0.90	1.396%	2.18	28.78	80.00	1.00	174.55
1979	Surface	Active	180.00	0.124%	0.90	1.454%	0.20	2.62	80.00	1.00	16.04
1980	Surface	Active	475.70	0.130%	0.90	1.552%	0.56	7.38	80.00	1.00	44.62
1981	Surface	Active	1,999.30	0.137%	0.94	1.644%	2.59	32.86	80.00	1.00	207.00
1982	Surface	Active	216.78	0.144%	0.90	1.729%	0.28	3.75	80.00	1.00	22.53
1983	Surface	Active	1,708.57	0.152%	0.90	1.809%	2.34	30.91	80.00	1.00	186.93
1984	Surface	Active	-	0.160%	0.00	1.883%	-	-	80.00	1.00	-
1985	Surface	Active	2,501.65	0.168%	0.76	1.950%	3.20	48.79	80.00	1.00	256.09
1986	Surface	Active	2,503.23	0.177%	0.99	2.012%	4.38	50.36	80.00	1.00	350.48
1987	Surface	Active	1,371.12	0.187%	1.02	2.067%	2.60	28.35	80.00	1.00	208.05
1988	Surface	Active	1,677.10	0.196%	0.86	2.117%	2.82	35.51	80.00	1.00	225.60
1989	Surface	Active	2,103.52	0.207%	0.90	2.161%	3.91	45.46	80.00	1.00	313.07
1990	Surface	Active	2,621.86	0.218%	0.84	2.199%	4.77	57.66	80.00	1.00	381.71
1991	Surface	Active	2,000.59	0.229%	0.98	2.232%	4.48	44.65	80.00	1.00	358.43
1992	Surface	Active	4,639.40	0.241%	0.90	2.259%	10.07	104.78	80.00	1.00	805.36
1993	Surface	Active	4,377.78	0.254%	0.90	2.280%	10.00	99.80	80.00	1.00	799.94
1994	Surface	Active	1,898.65	0.267%	0.75	2.295%	3.80	43.58	80.00	1.00	304.33
1995	Surface	Active	7,733.29	0.281%	0.96	2.305%	20.84	178.26	80.00	1.00	1,667.23
1996	Surface	Active	6,830.47	0.296%	0.99	2.309%	19.97	157.75	80.00	1.00	1,597.27
1997	Surface	Active	11,904.74	0.312%	0.96	2.308%	35.55	274.81	80.00	1.00	2,843.83
1998	Surface	Active	11,419.01	0.328%	0.87	2.302%	32.40	262.86	80.00	1.00	2,591.72
1999	Surface	Active	2,008.81	0.345%	0.81	2.290%	5.63	46.01	80.00	1.00	450.80
2000	Surface	Active	4,046.61	0.363%	0.84	2.273%	12.38	91.98	80.00	1.00	990.21
2001	Surface	Active	7,748.62	0.383%	0.93	2.251%	27.67	174.39	80.00	1.00	2,213.27
2002	Surface	Active	6,126.39	0.397%	0.93	2.223%	22.49	136.18	80.00	1.00	1,799.22
2003	Surface	Active	9,797.63	0.411%	0.92	2.190%	36.96	214.57	80.00	1.00	2,956.96
2004	Surface	Active	12,659.51	0.424%	0.93	2.152%	49.96	272.44	80.00	1.00	3,997.07
2005	Surface	Active	4,606.35	0.437%	1.04	2.109%	20.94	97.15	80.00	1.00	1,675.06
2006	Surface	Active	5,201.55	0.449%	0.96	2.061%	22.52	107.19	80.00	1.00	1,801.99
2007	Surface	Active	5,703.65	0.461%	0.93	2.008%	24.47	114.51	80.00	1.00	1,957.49
2008	Surface	Active	9,829.70	0.472%	0.86	1.950%	39.85	191.63	80.00	1.00	3,188.35
2009	Surface	Active	6,204.14	0.482%	0.88	1.887%	26.28	117.04	80.00	1.00	2,102.50
2010	Surface	Active	4,481.21	0.492%	1.00	1.819%	21.94	81.50	80.00	1.00	1,755.57
2011	Surface	Active	2,487.54	0.501%	0.85	1.746%	10.63	43.43	80.00	1.00	850.21
2012	Surface	Active	8,236.40	0.509%	0.92	1.668%	38.33	137.42	80.00	1.00	3,066.67
2013	Surface	Active	8,588.04	0.515%	0.96	1.586%	42.66	136.22	80.00	1.00	3,412.80
2014	Surface	Active	6,755.47	0.521%	0.83	1.499%	29.11	101.28	80.00	1.00	2,328.78
2015	Surface	Active	3,846.62	0.525%	0.90	1.412%	18.19	54.32	80.00	1.00	1,455.28
2016	Surface	Active	3,384.53	0.524%	0.86	1.309%	15.27	44.30	80.00	1.00	1,221.61
2017	Surface	Active	1,137.87	0.512%	1.08	1.189%	6.26	13.53	80.00	1.00	500.88
2018	Surface	Active	3,687.08	0.484%	1.03	1.046%	18.42	38.55	80.00	1.00	1,473.40
2019	Surface	Active	4,472.27	0.437%	0.94	0.873%	18.43	39.06	80.00	1.00	1,474.72
2020	Surface	Active	3,978.72	0.364%	0.74	0.666%	10.74	26.51	80.00	1.00	858.83
2021	Surface	Active	3,857.52	0.262%	0.85	0.418%	8.59	16.12	80.00	1.00	686.90
2022	Surface	Active	5,387.71	0.125%	1.04	0.122%	7.01	6.60	80.00	1.00	560.44
2023	Surface	Active	3,969.18	0.000%	0.99	0.000%	(0.00)	0.00	80.00	1.00	(0.00)

West Virginia Department of Environmental Protection Office of Special Reclamation
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Water Operations & Maintenance Cost Projection - Deterministic Model

				2024							
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Forfeiture Rate (5)	Adjustment Factor Permit Bond Size (6)	Release Rate (7)	Forfeited Acres (8)	Released Acres (9)	Avg Recl Cost per Acre (10)	Adjustment Factor Permit Status (11)	Gross Cost (12)
1965	Surface	Inactive	-	0.138%	0.00	0.483%	-	-	80.00	1.00	-
1966	Surface	Inactive	-	0.145%	0.00	0.503%	-	-	80.00	1.00	-
1967	Surface	Inactive	-	0.153%	0.00	0.524%	-	-	80.00	1.00	-
1968	Surface	Inactive	-	0.161%	0.00	0.546%	-	-	80.00	1.00	-
1969	Surface	Inactive	-	0.169%	0.00	0.569%	-	-	80.00	1.00	-
1970	Surface	Inactive	-	0.178%	0.00	0.592%	-	-	80.00	1.00	-
1971	Surface	Inactive	-	0.188%	0.00	0.617%	-	-	80.00	1.00	-
1972	Surface	Inactive	-	0.198%	0.00	0.643%	-	-	80.00	1.00	-
1973	Surface	Inactive	-	0.208%	0.00	0.669%	-	-	80.00	1.00	-
1974	Surface	Inactive	-	0.219%	0.00	0.697%	-	-	80.00	1.00	-
1975	Surface	Inactive	-	0.230%	0.00	0.726%	-	-	80.00	1.00	-
1976	Surface	Inactive	438.80	0.243%	0.55	0.757%	0.59	3.32	80.00	1.00	46.83
1977	Surface	Inactive	-	0.255%	0.00	0.788%	-	-	80.00	1.00	-
1978	Surface	Inactive	-	0.269%	0.00	0.821%	-	-	80.00	1.00	-
1979	Surface	Inactive	-	0.283%	0.00	0.855%	-	-	80.00	1.00	-
1980	Surface	Inactive	-	0.298%	0.00	0.913%	-	-	80.00	1.00	-
1981	Surface	Inactive	-	0.313%	0.00	0.967%	-	-	80.00	1.00	-
1982	Surface	Inactive	-	0.330%	0.00	1.017%	-	-	80.00	1.00	-
1983	Surface	Inactive	-	0.347%	0.00	1.064%	-	-	80.00	1.00	-
1984	Surface	Inactive	-	0.366%	0.00	1.107%	-	-	80.00	1.00	-
1985	Surface	Inactive	-	0.385%	0.00	1.147%	-	-	80.00	1.00	-
1986	Surface	Inactive	411.07	0.405%	0.90	1.183%	1.50	4.86	80.00	1.00	119.90
1987	Surface	Inactive	415.61	0.426%	1.08	1.216%	1.91	5.05	80.00	1.00	152.41
1988	Surface	Inactive	1,304.38	0.449%	0.90	1.245%	5.27	16.25	80.00	1.00	421.55
1989	Surface	Inactive	176.00	0.472%	0.90	1.271%	0.75	2.24	80.00	1.00	59.87
1990	Surface	Inactive	70.12	0.497%	0.55	1.294%	0.19	0.91	80.00	1.00	15.34
1991	Surface	Inactive	-	0.524%	0.00	1.313%	-	-	80.00	1.00	-
1992	Surface	Inactive	-	0.551%	0.00	1.329%	-	-	80.00	1.00	-
1993	Surface	Inactive	-	0.580%	0.00	1.341%	-	-	80.00	1.00	-
1994	Surface	Inactive	-	0.611%	0.00	1.350%	-	-	80.00	1.00	-
1995	Surface	Inactive	2,098.71	0.643%	0.90	1.356%	12.14	28.46	80.00	1.00	971.25
1996	Surface	Inactive	-	0.677%	0.00	1.359%	-	-	80.00	1.00	-
1997	Surface	Inactive	-	0.712%	0.00	1.358%	-	-	80.00	1.00	-
1998	Surface	Inactive	846.89	0.750%	0.90	1.354%	5.71	11.47	80.00	1.00	457.13
1999	Surface	Inactive	1,733.11	0.789%	1.25	1.347%	17.10	23.35	80.00	1.00	1,367.66
2000	Surface	Inactive	-	0.831%	0.00	1.337%	-	-	80.00	1.00	-
2001	Surface	Inactive	-	0.874%	0.00	1.324%	-	-	80.00	1.00	-
2002	Surface	Inactive	1,146.85	0.907%	0.78	1.308%	8.15	15.00	80.00	1.00	651.95
2003	Surface	Inactive	1,161.50	0.939%	0.90	1.288%	9.81	14.96	80.00	1.00	785.17
2004	Surface	Inactive	3,700.97	0.970%	0.90	1.266%	32.29	46.85	80.00	1.00	2,583.56
2005	Surface	Inactive	-	0.999%	0.00	1.241%	-	-	80.00	1.00	-
2006	Surface	Inactive	244.59	1.027%	0.55	1.212%	1.38	2.97	80.00	1.00	110.54
2007	Surface	Inactive	1,080.24	1.054%	0.55	1.181%	6.26	12.76	80.00	1.00	500.92
2008	Surface	Inactive	118.60	1.079%	1.25	1.147%	1.60	1.36	80.00	1.00	127.98
2009	Surface	Inactive	680.43	1.103%	0.55	1.110%	4.13	7.55	80.00	1.00	330.12
2010	Surface	Inactive	1,146.11	1.124%	1.08	1.070%	13.85	12.26	80.00	1.00	1,108.30
2011	Surface	Inactive	1,088.67	1.144%	0.78	1.027%	9.76	11.18	80.00	1.00	780.73
2012	Surface	Inactive	-	1.162%	0.00	0.981%	-	-	80.00	1.00	-
2013	Surface	Inactive	93.44	1.178%	0.55	0.933%	0.61	0.87	80.00	1.00	48.44
2014	Surface	Inactive	415.42	1.192%	0.90	0.882%	4.46	3.66	80.00	1.00	356.52
2015	Surface	Inactive	1,156.30	1.201%	0.67	0.831%	9.26	9.61	80.00	1.00	740.67
2016	Surface	Inactive	776.75	1.198%	0.73	0.770%	6.74	5.98	80.00	1.00	539.53
2017	Surface	Inactive	154.63	1.170%	0.90	0.699%	1.63	1.08	80.00	1.00	130.25
2018	Surface	Inactive	351.08	1.107%	0.90	0.615%	3.50	2.16	80.00	1.00	279.86
2019	Surface	Inactive	452.10	0.998%	0.90	0.514%	4.06	2.32	80.00	1.00	324.95
2020	Surface	Inactive	-	0.832%	0.00	0.392%	-	-	80.00	1.00	-
2021	Surface	Inactive	-	0.599%	0.00	0.246%	-	-	80.00	1.00	-
2022	Surface	Inactive	-	0.286%	0.00	0.072%	-	-	80.00	1.00	-
2023	Surface	Inactive	-	0.000%	0.00	0.000%	-	-	80.00	1.00	-

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				2024							
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Forfeiture Rate (5)	Adjustment Factor Permit Bond Size (6)	Release Rate (7)	Forfeited Acres (8)	Released Acres (9)	Avg Recl Cost per Acre (10)	Adjustment Factor Permit Status (11)	Gross Cost (12)
1965	Surface	Phased Released	-	0.160%	0.00	2.221%	-	-	80.00	1.00	-
1966	Surface	Phased Released	-	0.168%	0.00	2.314%	-	-	80.00	1.00	-
1967	Surface	Phased Released	-	0.177%	0.00	2.410%	-	-	80.00	1.00	-
1968	Surface	Phased Released	-	0.186%	0.00	2.511%	-	-	80.00	1.00	-
1969	Surface	Phased Released	-	0.196%	0.00	2.615%	-	-	80.00	1.00	-
1970	Surface	Phased Released	-	0.206%	0.00	2.724%	-	-	80.00	1.00	-
1971	Surface	Phased Released	-	0.217%	0.00	2.838%	-	-	80.00	1.00	-
1972	Surface	Phased Released	-	0.228%	0.00	2.956%	-	-	80.00	1.00	-
1973	Surface	Phased Released	-	0.240%	0.00	3.079%	-	-	80.00	1.00	-
1974	Surface	Phased Released	189.60	0.253%	1.25	3.208%	0.60	6.08	80.00	1.00	47.99
1975	Surface	Phased Released	7.80	0.266%	1.25	3.341%	0.03	0.26	80.00	1.00	2.08
1976	Surface	Phased Released	626.17	0.280%	1.25	3.480%	2.20	21.79	80.00	1.00	175.61
1977	Surface	Phased Released	48.00	0.295%	1.25	3.625%	0.18	1.74	80.00	1.00	14.17
1978	Surface	Phased Released	158.81	0.311%	1.25	3.777%	0.62	6.00	80.00	1.00	49.35
1979	Surface	Phased Released	358.00	0.327%	1.25	3.934%	1.46	14.08	80.00	1.00	117.10
1980	Surface	Phased Released	253.42	0.344%	1.25	4.199%	1.09	10.64	80.00	1.00	87.26
1981	Surface	Phased Released	1,785.41	0.362%	1.00	4.448%	6.47	79.41	80.00	1.00	517.67
1982	Surface	Phased Released	-	0.382%	0.00	4.680%	-	-	80.00	1.00	-
1983	Surface	Phased Released	302.61	0.402%	1.25	4.895%	1.52	14.81	80.00	1.00	121.52
1984	Surface	Phased Released	2,585.75	0.423%	1.08	5.094%	11.75	131.72	80.00	1.00	940.03
1985	Surface	Phased Released	1,270.29	0.445%	0.90	5.277%	5.09	67.03	80.00	1.00	406.98
1986	Surface	Phased Released	1,041.15	0.468%	0.90	5.444%	4.39	56.68	80.00	1.00	351.12
1987	Surface	Phased Released	760.81	0.493%	0.90	5.594%	3.38	42.56	80.00	1.00	270.08
1988	Surface	Phased Released	478.00	0.519%	1.25	5.729%	3.10	27.38	80.00	1.00	248.08
1989	Surface	Phased Released	1,098.64	0.546%	1.11	5.848%	6.66	64.25	80.00	1.00	532.98
1990	Surface	Phased Released	764.18	0.575%	1.25	5.951%	5.49	45.48	80.00	1.00	439.45
1991	Surface	Phased Released	1,006.45	0.605%	0.97	6.039%	5.91	60.78	80.00	1.00	472.77
1992	Surface	Phased Released	-	0.637%	0.00	6.111%	-	-	80.00	1.00	-
1993	Surface	Phased Released	562.59	0.671%	1.25	6.168%	4.72	34.70	80.00	1.00	377.34
1994	Surface	Phased Released	386.03	0.706%	0.90	6.210%	2.45	23.97	80.00	1.00	196.23
1995	Surface	Phased Released	484.30	0.743%	1.13	6.237%	4.08	30.21	80.00	1.00	326.33
1996	Surface	Phased Released	675.12	0.782%	0.90	6.249%	4.75	42.19	80.00	1.00	380.27
1997	Surface	Phased Released	969.50	0.823%	1.08	6.246%	8.58	60.56	80.00	1.00	686.59
1998	Surface	Phased Released	511.73	0.867%	0.78	6.229%	3.47	31.88	80.00	1.00	277.97
1999	Surface	Phased Released	14.87	0.912%	1.25	6.197%	0.17	0.92	80.00	1.00	13.57
2000	Surface	Phased Released	19.70	0.960%	1.25	6.151%	0.24	1.21	80.00	1.00	18.92
2001	Surface	Phased Released	491.55	1.011%	1.02	6.090%	5.05	29.93	80.00	1.00	404.20
2002	Surface	Phased Released	154.49	1.049%	1.25	6.015%	2.03	9.29	80.00	1.00	162.04
2003	Surface	Phased Released	-	1.086%	1.25	5.926%	-	-	80.00	1.00	-
2004	Surface	Phased Released	470.13	1.121%	1.08	5.823%	5.67	27.38	80.00	1.00	453.25
2005	Surface	Phased Released	51.50	1.155%	1.25	5.707%	0.74	2.94	80.00	1.00	59.49
2006	Surface	Phased Released	60.78	1.188%	1.25	5.576%	0.90	3.39	80.00	1.00	72.19
2007	Surface	Phased Released	186.68	1.219%	0.55	5.433%	1.25	10.14	80.00	1.00	100.09
2008	Surface	Phased Released	-	1.248%	0.00	5.275%	-	-	80.00	1.00	-
2009	Surface	Phased Released	220.84	1.275%	0.90	5.105%	2.53	11.27	80.00	1.00	202.72
2010	Surface	Phased Released	-	1.300%	0.00	4.921%	-	-	80.00	1.00	-
2011	Surface	Phased Released	214.01	1.323%	1.25	4.724%	3.54	10.11	80.00	1.00	283.18
2012	Surface	Phased Released	-	1.344%	0.00	4.514%	-	-	80.00	1.00	-
2013	Surface	Phased Released	-	1.362%	0.00	4.292%	-	-	80.00	1.00	-
2014	Surface	Phased Released	27.91	1.378%	1.25	4.057%	0.48	1.13	80.00	1.00	38.47
2015	Surface	Phased Released	-	1.389%	0.00	3.821%	-	-	80.00	1.00	-
2016	Surface	Phased Released	-	1.385%	0.00	3.542%	-	-	80.00	1.00	-
2017	Surface	Phased Released	-	1.353%	0.00	3.216%	-	-	80.00	1.00	-
2018	Surface	Phased Released	-	1.280%	0.00	2.829%	-	-	80.00	1.00	-
2019	Surface	Phased Released	-	1.154%	0.00	2.363%	-	-	80.00	1.00	-
2020	Surface	Phased Released	-	0.962%	0.00	1.803%	-	-	80.00	1.00	-
2021	Surface	Phased Released	-	0.692%	0.00	1.131%	-	-	80.00	1.00	-
2022	Surface	Phased Released	-	0.330%	0.00	0.331%	-	-	80.00	1.00	-
2023	Surface	Phased Released	-	0.000%	0.00	0.000%	-	-	80.00	1.00	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Underground	Active	-	0.101%	0.00	0.594%	-	-	135.00	1.00	-
1966	Underground	Active	-	0.104%	0.00	0.619%	-	-	135.00	1.00	-
1967	Underground	Active	-	0.107%	0.00	0.645%	-	-	135.00	1.00	-
1968	Underground	Active	-	0.109%	0.00	0.672%	-	-	135.00	1.00	-
1969	Underground	Active	-	0.112%	0.00	0.700%	-	-	135.00	1.00	-
1970	Underground	Active	-	0.115%	0.00	0.729%	-	-	135.00	1.00	-
1971	Underground	Active	-	0.118%	0.00	0.759%	-	-	135.00	1.00	-
1972	Underground	Active	-	0.121%	0.00	0.791%	-	-	135.00	1.00	-
1973	Underground	Active	-	0.124%	0.00	0.824%	-	-	135.00	1.00	-
1974	Underground	Active	-	0.127%	0.00	0.858%	-	-	135.00	1.00	-
1975	Underground	Active	-	0.131%	0.00	0.894%	-	-	135.00	1.00	-
1976	Underground	Active	-	0.134%	0.00	0.931%	-	-	135.00	1.00	-
1977	Underground	Active	-	0.137%	0.00	0.970%	-	-	135.00	1.00	-
1978	Underground	Active	-	0.141%	0.00	1.076%	-	-	135.00	1.00	-
1979	Underground	Active	755.59	0.145%	1.03	1.183%	1.13	8.94	135.00	1.00	152.04
1980	Underground	Active	222.16	0.148%	0.97	1.290%	0.32	2.87	135.00	1.00	43.13
1981	Underground	Active	720.89	0.152%	1.17	1.397%	1.28	10.07	135.00	1.00	172.78
1982	Underground	Active	80.68	0.156%	1.02	1.503%	0.13	1.21	135.00	1.00	17.27
1983	Underground	Active	7,126.06	0.160%	0.91	1.609%	10.40	114.64	135.00	1.00	1,403.39
1984	Underground	Active	2,930.46	0.164%	1.02	1.713%	4.92	50.19	135.00	1.00	664.25
1985	Underground	Active	49.00	0.168%	1.25	1.815%	0.10	0.89	135.00	1.00	13.91
1986	Underground	Active	252.11	0.173%	1.11	1.915%	0.48	4.83	135.00	1.00	65.19
1987	Underground	Active	203.45	0.177%	1.11	2.013%	0.40	4.10	135.00	1.00	53.96
1988	Underground	Active	179.01	0.182%	1.11	2.108%	0.36	3.77	135.00	1.00	48.69
1989	Underground	Active	124.25	0.186%	1.25	2.199%	0.29	2.73	135.00	1.00	39.04
1990	Underground	Active	131.40	0.191%	1.08	2.287%	0.27	3.01	135.00	1.00	36.41
1991	Underground	Active	35.30	0.196%	1.25	2.370%	0.09	0.84	135.00	1.00	11.67
1992	Underground	Active	1,073.06	0.201%	0.96	2.449%	2.07	26.28	135.00	1.00	278.87
1993	Underground	Active	974.28	0.206%	1.02	2.523%	2.04	24.58	135.00	1.00	275.50
1994	Underground	Active	756.33	0.211%	0.99	2.592%	1.58	19.60	135.00	1.00	213.06
1995	Underground	Active	273.19	0.224%	1.02	2.655%	0.62	7.25	135.00	1.00	83.99
1996	Underground	Active	242.74	0.237%	1.04	2.711%	0.60	6.58	135.00	1.00	80.62
1997	Underground	Active	239.17	0.249%	1.09	2.761%	0.65	6.60	135.00	1.00	87.46
1998	Underground	Active	558.33	0.261%	0.99	2.804%	1.44	15.66	135.00	1.00	194.19
1999	Underground	Active	117.00	0.273%	1.25	2.840%	0.40	3.32	135.00	1.00	53.82
2000	Underground	Active	281.79	0.284%	1.08	2.868%	0.86	8.08	135.00	1.00	116.11
2001	Underground	Active	224.71	0.295%	0.83	2.887%	0.55	6.49	135.00	1.00	74.23
2002	Underground	Active	265.26	0.305%	1.16	2.898%	0.94	7.69	135.00	1.00	127.05
2003	Underground	Active	998.12	0.315%	1.15	2.900%	3.63	28.95	135.00	1.00	490.12
2004	Underground	Active	460.97	0.324%	1.00	2.893%	1.49	13.33	135.00	1.00	201.81
2005	Underground	Active	325.84	0.333%	0.95	2.875%	1.03	9.37	135.00	1.00	139.11
2006	Underground	Active	433.77	0.341%	0.83	2.848%	1.23	12.35	135.00	1.00	165.62
2007	Underground	Active	594.07	0.348%	1.10	2.810%	2.28	16.69	135.00	1.00	308.05
2008	Underground	Active	107.24	0.354%	1.25	2.760%	0.47	2.96	135.00	1.00	64.09
2009	Underground	Active	344.39	0.360%	0.90	2.700%	1.11	9.30	135.00	1.00	150.47
2010	Underground	Active	241.30	0.364%	1.16	2.627%	1.02	6.34	135.00	1.00	137.88
2011	Underground	Active	201.31	0.368%	1.15	2.543%	0.85	5.12	135.00	1.00	114.89
2012	Underground	Active	220.12	0.370%	1.05	2.445%	0.86	5.38	135.00	1.00	115.48
2013	Underground	Active	495.72	0.371%	1.03	2.335%	1.89	11.57	135.00	1.00	254.83
2014	Underground	Active	752.00	0.372%	1.06	2.211%	2.96	16.63	135.00	1.00	399.70
2015	Underground	Active	157.00	0.369%	1.15	2.073%	0.67	3.25	135.00	1.00	89.90
2016	Underground	Active	135.36	0.364%	1.25	1.921%	0.62	2.60	135.00	1.00	83.06
2017	Underground	Active	161.03	0.351%	1.25	1.754%	0.71	2.82	135.00	1.00	95.44
2018	Underground	Active	52.55	0.329%	1.25	1.572%	0.22	0.83	135.00	1.00	29.15
2019	Underground	Active	149.13	0.293%	1.08	1.375%	0.47	2.05	135.00	1.00	63.44
2020	Underground	Active	126.64	0.241%	1.25	1.162%	0.38	1.47	135.00	1.00	51.61
2021	Underground	Active	76.97	0.171%	1.25	0.932%	0.16	0.72	135.00	1.00	22.19
2022	Underground	Active	43.22	0.078%	1.25	0.686%	0.04	0.30	135.00	1.00	5.71
2023	Underground	Active	69.14	0.000%	1.25	0.423%	(0.00)	0.29	135.00	1.00	(0.00)

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1965	Underground	Inactive	-	0.232%	0.00	0.350%	-	-	135.00	1.00	-
1966	Underground	Inactive	-	0.238%	0.00	0.364%	-	-	135.00	1.00	-
1967	Underground	Inactive	-	0.244%	0.00	0.379%	-	-	135.00	1.00	-
1968	Underground	Inactive	-	0.250%	0.00	0.395%	-	-	135.00	1.00	-
1969	Underground	Inactive	-	0.256%	0.00	0.412%	-	-	135.00	1.00	-
1970	Underground	Inactive	-	0.263%	0.00	0.429%	-	-	135.00	1.00	-
1971	Underground	Inactive	-	0.270%	0.00	0.447%	-	-	135.00	1.00	-
1972	Underground	Inactive	-	0.277%	0.00	0.465%	-	-	135.00	1.00	-
1973	Underground	Inactive	-	0.284%	0.00	0.485%	-	-	135.00	1.00	-
1974	Underground	Inactive	-	0.291%	0.00	0.505%	-	-	135.00	1.00	-
1975	Underground	Inactive	-	0.299%	0.00	0.526%	-	-	135.00	1.00	-
1976	Underground	Inactive	26.50	0.306%	0.55	0.548%	0.04	0.15	135.00	1.00	6.03
1977	Underground	Inactive	-	0.314%	0.00	0.571%	-	-	135.00	1.00	-
1978	Underground	Inactive	117.89	0.322%	0.55	0.633%	0.21	0.75	135.00	1.00	28.20
1979	Underground	Inactive	-	0.330%	0.00	0.696%	-	-	135.00	1.00	-
1980	Underground	Inactive	-	0.339%	0.00	0.759%	-	-	135.00	1.00	-
1981	Underground	Inactive	189.58	0.348%	0.73	0.822%	0.48	1.56	135.00	1.00	64.49
1982	Underground	Inactive	72.51	0.356%	0.55	0.884%	0.14	0.64	135.00	1.00	19.19
1983	Underground	Inactive	285.25	0.366%	0.78	0.946%	0.82	2.70	135.00	1.00	110.28
1984	Underground	Inactive	-	0.375%	0.00	1.008%	-	-	135.00	1.00	-
1985	Underground	Inactive	220.21	0.385%	0.90	1.068%	0.76	2.35	135.00	1.00	102.90
1986	Underground	Inactive	43.54	0.394%	0.55	1.127%	0.09	0.49	135.00	1.00	12.75
1987	Underground	Inactive	40.89	0.405%	0.55	1.184%	0.09	0.48	135.00	1.00	12.28
1988	Underground	Inactive	73.42	0.415%	1.19	1.240%	0.36	0.91	135.00	1.00	49.01
1989	Underground	Inactive	193.50	0.426%	0.55	1.294%	0.45	2.50	135.00	1.00	61.14
1990	Underground	Inactive	47.64	0.436%	1.08	1.345%	0.22	0.64	135.00	1.00	30.18
1991	Underground	Inactive	362.42	0.448%	1.02	1.394%	1.65	5.05	135.00	1.00	222.68
1992	Underground	Inactive	9.00	0.459%	1.25	1.441%	0.05	0.13	135.00	1.00	6.97
1993	Underground	Inactive	35.86	0.471%	0.90	1.484%	0.15	0.53	135.00	1.00	20.52
1994	Underground	Inactive	100.78	0.483%	0.55	1.525%	0.27	1.54	135.00	1.00	36.14
1995	Underground	Inactive	182.46	0.512%	0.67	1.561%	0.62	2.85	135.00	1.00	84.08
1996	Underground	Inactive	55.21	0.541%	1.25	1.595%	0.37	0.88	135.00	1.00	50.37
1997	Underground	Inactive	282.76	0.569%	1.02	1.624%	1.64	4.59	135.00	1.00	220.75
1998	Underground	Inactive	72.14	0.596%	0.90	1.649%	0.39	1.19	135.00	1.00	52.27
1999	Underground	Inactive	606.66	0.623%	1.11	1.670%	4.20	10.13	135.00	1.00	566.44
2000	Underground	Inactive	256.24	0.649%	1.16	1.687%	1.93	4.32	135.00	1.00	260.98
2001	Underground	Inactive	6.00	0.674%	1.25	1.698%	0.05	0.10	135.00	1.00	6.82
2002	Underground	Inactive	47.21	0.698%	0.90	1.705%	0.30	0.80	135.00	1.00	40.01
2003	Underground	Inactive	212.02	0.720%	0.76	1.706%	1.16	3.62	135.00	1.00	156.65
2004	Underground	Inactive	180.23	0.741%	0.55	1.702%	0.73	3.07	135.00	1.00	99.19
2005	Underground	Inactive	124.90	0.761%	1.11	1.691%	1.05	2.11	135.00	1.00	142.41
2006	Underground	Inactive	160.75	0.779%	1.02	1.675%	1.27	2.69	135.00	1.00	171.84
2007	Underground	Inactive	107.80	0.795%	0.78	1.653%	0.67	1.78	135.00	1.00	90.64
2008	Underground	Inactive	79.05	0.810%	1.25	1.624%	0.80	1.28	135.00	1.00	107.99
2009	Underground	Inactive	111.36	0.822%	1.15	1.588%	1.05	1.77	135.00	1.00	142.10
2010	Underground	Inactive	161.54	0.832%	1.17	1.545%	1.58	2.50	135.00	1.00	212.75
2011	Underground	Inactive	129.26	0.840%	1.15	1.496%	1.25	1.93	135.00	1.00	168.62
2012	Underground	Inactive	32.84	0.846%	0.55	1.438%	0.15	0.47	135.00	1.00	20.63
2013	Underground	Inactive	44.71	0.849%	1.25	1.373%	0.47	0.61	135.00	1.00	64.07
2014	Underground	Inactive	12.00	0.850%	1.25	1.300%	0.13	0.16	135.00	1.00	17.21
2015	Underground	Inactive	16.83	0.843%	1.25	1.219%	0.18	0.21	135.00	1.00	23.94
2016	Underground	Inactive	13.42	0.831%	1.25	1.130%	0.14	0.15	135.00	1.00	18.82
2017	Underground	Inactive	-	0.803%	0.00	1.032%	-	-	135.00	1.00	-
2018	Underground	Inactive	37.86	0.751%	1.25	0.925%	0.36	0.35	135.00	1.00	48.00
2019	Underground	Inactive	-	0.670%	0.00	0.809%	-	-	135.00	1.00	-
2020	Underground	Inactive	-	0.552%	0.00	0.683%	-	-	135.00	1.00	-
2021	Underground	Inactive	-	0.391%	0.00	0.548%	-	-	135.00	1.00	-
2022	Underground	Inactive	-	0.179%	0.00	0.404%	-	-	135.00	1.00	-
2023	Underground	Inactive	-	0.000%	0.00	0.249%	-	-	135.00	1.00	-

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				2024							
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg Recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Underground	Phased Released	-	0.268%	0.00	1.608%	-	-	135.00	1.00	-
1966	Underground	Phased Released	-	0.275%	0.00	1.675%	-	-	135.00	1.00	-
1967	Underground	Phased Released	-	0.282%	0.00	1.745%	-	-	135.00	1.00	-
1968	Underground	Phased Released	-	0.289%	0.00	1.818%	-	-	135.00	1.00	-
1969	Underground	Phased Released	-	0.297%	0.00	1.894%	-	-	135.00	1.00	-
1970	Underground	Phased Released	-	0.304%	0.00	1.973%	-	-	135.00	1.00	-
1971	Underground	Phased Released	-	0.312%	0.00	2.055%	-	-	135.00	1.00	-
1972	Underground	Phased Released	-	0.320%	0.00	2.140%	-	-	135.00	1.00	-
1973	Underground	Phased Released	-	0.328%	0.00	2.230%	-	-	135.00	1.00	-
1974	Underground	Phased Released	-	0.337%	0.00	2.323%	-	-	135.00	1.00	-
1975	Underground	Phased Released	-	0.345%	0.00	2.419%	-	-	135.00	1.00	-
1976	Underground	Phased Released	-	0.354%	0.00	2.520%	-	-	135.00	1.00	-
1977	Underground	Phased Released	-	0.363%	0.00	2.625%	-	-	135.00	1.00	-
1978	Underground	Phased Released	10.58	0.372%	1.25	2.912%	0.05	0.31	135.00	1.00	6.65
1979	Underground	Phased Released	59.68	0.382%	1.25	3.201%	0.28	1.91	135.00	1.00	38.47
1980	Underground	Phased Released	87.19	0.392%	1.25	3.490%	0.43	3.04	135.00	1.00	57.65
1981	Underground	Phased Released	66.33	0.402%	1.13	3.780%	0.30	2.51	135.00	1.00	40.78
1982	Underground	Phased Released	194.36	0.412%	1.25	4.068%	1.00	7.91	135.00	1.00	135.18
1983	Underground	Phased Released	70.38	0.423%	1.25	4.353%	0.37	3.06	135.00	1.00	50.20
1984	Underground	Phased Released	80.60	0.434%	0.55	4.635%	0.19	3.74	135.00	1.00	25.95
1985	Underground	Phased Released	17.24	0.445%	1.25	4.912%	0.10	0.85	135.00	1.00	12.94
1986	Underground	Phased Released	118.96	0.456%	1.25	5.183%	0.68	6.17	135.00	1.00	91.55
1987	Underground	Phased Released	67.09	0.468%	1.25	5.447%	0.39	3.65	135.00	1.00	52.96
1988	Underground	Phased Released	197.49	0.480%	1.25	5.704%	1.18	11.26	135.00	1.00	159.89
1989	Underground	Phased Released	80.68	0.492%	1.25	5.951%	0.50	4.80	135.00	1.00	66.99
1990	Underground	Phased Released	18.31	0.505%	1.25	6.188%	0.12	1.13	135.00	1.00	15.59
1991	Underground	Phased Released	23.22	0.518%	1.25	6.414%	0.15	1.49	135.00	1.00	20.28
1992	Underground	Phased Released	39.95	0.531%	1.25	6.628%	0.27	2.65	135.00	1.00	35.79
1993	Underground	Phased Released	68.38	0.544%	1.25	6.828%	0.47	4.67	135.00	1.00	62.83
1994	Underground	Phased Released	18.79	0.558%	1.25	7.013%	0.13	1.32	135.00	1.00	17.71
1995	Underground	Phased Released	60.54	0.592%	1.25	7.183%	0.45	4.35	135.00	1.00	60.48
1996	Underground	Phased Released	133.37	0.625%	1.25	7.336%	1.04	9.78	135.00	1.00	140.70
1997	Underground	Phased Released	119.99	0.658%	1.25	7.471%	0.99	8.96	135.00	1.00	133.17
1998	Underground	Phased Released	64.00	0.690%	1.25	7.588%	0.55	4.86	135.00	1.00	74.47
1999	Underground	Phased Released	246.00	0.720%	0.90	7.684%	1.60	18.90	135.00	1.00	215.34
2000	Underground	Phased Released	59.65	0.750%	1.25	7.759%	0.56	4.63	135.00	1.00	75.53
2001	Underground	Phased Released	36.60	0.779%	1.25	7.812%	0.36	2.86	135.00	1.00	48.12
2002	Underground	Phased Released	48.55	0.807%	1.25	7.842%	0.49	3.81	135.00	1.00	66.08
2003	Underground	Phased Released	31.05	0.833%	1.25	7.847%	0.32	2.44	135.00	1.00	43.63
2004	Underground	Phased Released	-	0.857%	0.00	7.827%	-	-	135.00	1.00	-
2005	Underground	Phased Released	21.73	0.880%	1.25	7.780%	0.24	1.69	135.00	1.00	32.26
2006	Underground	Phased Released	-	0.901%	0.00	7.706%	-	-	135.00	1.00	-
2007	Underground	Phased Released	-	0.919%	0.00	7.602%	-	-	135.00	1.00	-
2008	Underground	Phased Released	63.64	0.936%	1.25	7.469%	0.74	4.75	135.00	1.00	100.52
2009	Underground	Phased Released	54.60	0.950%	1.25	7.305%	0.65	3.99	135.00	1.00	87.56
2010	Underground	Phased Released	-	0.962%	0.00	7.109%	-	-	135.00	1.00	-
2011	Underground	Phased Released	25.60	0.972%	1.25	6.880%	0.31	1.76	135.00	1.00	41.97
2012	Underground	Phased Released	-	0.978%	0.00	6.616%	-	-	135.00	1.00	-
2013	Underground	Phased Released	-	0.982%	0.00	6.317%	-	-	135.00	1.00	-
2014	Underground	Phased Released	-	0.982%	0.00	5.982%	-	-	135.00	1.00	-
2015	Underground	Phased Released	-	0.975%	0.00	5.609%	-	-	135.00	1.00	-
2016	Underground	Phased Released	-	0.961%	0.00	5.198%	-	-	135.00	1.00	-
2017	Underground	Phased Released	-	0.928%	0.00	4.747%	-	-	135.00	1.00	-
2018	Underground	Phased Released	-	0.869%	0.00	4.255%	-	-	135.00	1.00	-
2019	Underground	Phased Released	-	0.775%	0.00	3.721%	-	-	135.00	1.00	-
2020	Underground	Phased Released	-	0.638%	0.00	3.144%	-	-	135.00	1.00	-
2021	Underground	Phased Released	-	0.452%	0.00	2.523%	-	-	135.00	1.00	-
2022	Underground	Phased Released	-	0.207%	0.00	1.857%	-	-	135.00	1.00	-
2023	Underground	Phased Released	-	0.000%	0.00	1.144%	-	-	135.00	1.00	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Other	Active	-	0.146%	0.00	1.975%	-	-	130.00	1.00	-
1966	Other	Active	-	0.150%	0.00	2.015%	-	-	130.00	1.00	-
1967	Other	Active	-	0.154%	0.00	2.056%	-	-	130.00	1.00	-
1968	Other	Active	-	0.158%	0.00	2.098%	-	-	130.00	1.00	-
1969	Other	Active	-	0.162%	0.00	2.141%	-	-	130.00	1.00	-
1970	Other	Active	-	0.166%	0.00	2.185%	-	-	130.00	1.00	-
1971	Other	Active	-	0.170%	0.00	2.229%	-	-	130.00	1.00	-
1972	Other	Active	20.00	0.175%	1.25	2.275%	0.04	0.45	130.00	1.00	5.68
1973	Other	Active	-	0.179%	0.00	2.321%	-	-	130.00	1.00	-
1974	Other	Active	28.52	0.184%	1.25	2.368%	0.07	0.68	130.00	1.00	8.52
1975	Other	Active	6.20	0.189%	1.25	2.417%	0.01	0.15	130.00	1.00	1.90
1976	Other	Active	-	0.193%	0.00	2.466%	-	-	130.00	1.00	-
1977	Other	Active	223.99	0.198%	1.08	2.516%	0.48	5.64	130.00	1.00	62.12
1978	Other	Active	-	0.204%	0.00	2.568%	-	-	130.00	1.00	-
1979	Other	Active	65.00	0.209%	1.25	2.570%	0.17	1.67	130.00	1.00	22.05
1980	Other	Active	364.74	0.214%	1.05	2.541%	0.82	9.27	130.00	1.00	106.59
1981	Other	Active	5,211.96	0.220%	0.91	2.483%	10.41	129.40	130.00	1.00	1,352.72
1982	Other	Active	586.43	0.225%	0.90	2.400%	1.19	14.08	130.00	1.00	154.52
1983	Other	Active	3,861.09	0.231%	0.86	2.296%	7.68	88.66	130.00	1.00	998.40
1984	Other	Active	4,421.79	0.237%	0.76	2.174%	8.01	96.14	130.00	1.00	1,041.15
1985	Other	Active	1,543.19	0.243%	1.03	2.038%	3.88	31.45	130.00	1.00	504.34
1986	Other	Active	1,384.69	0.249%	0.95	1.891%	3.29	26.18	130.00	1.00	427.91
1987	Other	Active	974.10	0.256%	1.00	1.737%	2.49	16.92	130.00	1.00	323.68
1988	Other	Active	618.27	0.262%	1.06	1.578%	1.71	9.76	130.00	1.00	222.42
1989	Other	Active	290.43	0.269%	1.15	1.419%	0.90	4.12	130.00	1.00	116.75
1990	Other	Active	344.46	0.276%	0.97	1.264%	0.92	4.35	130.00	1.00	119.79
1991	Other	Active	491.29	0.283%	1.19	1.115%	1.66	5.48	130.00	1.00	215.27
1992	Other	Active	391.14	0.290%	1.04	0.976%	1.18	3.82	130.00	1.00	153.41
1993	Other	Active	946.05	0.298%	0.80	0.850%	2.24	8.04	130.00	1.00	290.92
1994	Other	Active	2,315.41	0.305%	0.87	0.742%	6.17	17.18	130.00	1.00	801.98
1995	Other	Active	950.69	0.313%	1.08	0.654%	3.20	6.22	130.00	1.00	415.84
1996	Other	Active	1,971.02	0.321%	0.78	0.591%	4.96	11.64	130.00	1.00	644.33
1997	Other	Active	1,403.71	0.329%	0.90	0.555%	4.16	7.78	130.00	1.00	540.74
1998	Other	Active	1,144.42	0.338%	1.04	0.549%	4.02	6.29	130.00	1.00	522.50
1999	Other	Active	404.95	0.346%	0.97	0.579%	1.36	2.34	130.00	1.00	176.86
2000	Other	Active	222.50	0.355%	0.90	0.646%	0.71	1.44	130.00	1.00	92.48
2001	Other	Active	381.08	0.364%	0.83	0.756%	1.15	2.88	130.00	1.00	149.81
2002	Other	Active	818.79	0.374%	1.16	0.910%	3.56	7.45	130.00	1.00	462.39
2003	Other	Active	908.39	0.383%	1.13	1.112%	3.95	10.10	130.00	1.00	512.95
2004	Other	Active	1,149.70	0.455%	0.99	1.367%	5.16	15.71	130.00	1.00	671.19
2005	Other	Active	23.99	0.535%	0.90	1.677%	0.12	0.40	130.00	1.00	15.02
2006	Other	Active	491.96	0.625%	1.00	2.046%	3.08	10.07	130.00	1.00	399.85
2007	Other	Active	394.47	0.725%	1.08	2.478%	3.07	9.77	130.00	1.00	399.72
2008	Other	Active	599.63	0.835%	1.10	2.975%	5.51	17.84	130.00	1.00	716.30
2009	Other	Active	174.78	0.956%	1.08	3.542%	1.80	6.19	130.00	1.00	233.63
2010	Other	Active	1,066.83	1.084%	0.98	4.182%	11.31	44.62	130.00	1.00	1,470.28
2011	Other	Active	365.79	1.207%	0.90	4.899%	3.97	17.92	130.00	1.00	516.38
2012	Other	Active	213.57	1.304%	1.16	5.695%	3.24	12.16	130.00	1.00	420.85
2013	Other	Active	2,100.30	1.358%	1.00	6.575%	28.45	138.10	130.00	1.00	3,697.87
2014	Other	Active	282.83	1.351%	1.21	7.542%	4.61	21.33	130.00	1.00	599.19
2015	Other	Active	1,105.29	1.264%	1.13	8.768%	15.84	96.91	130.00	1.00	2,059.16
2016	Other	Active	1,513.50	1.100%	1.13	11.452%	18.88	173.33	130.00	1.00	2,453.83
2017	Other	Active	385.95	0.861%	1.13	16.294%	3.77	62.89	130.00	1.00	489.62
2018	Other	Active	21.89	0.596%	1.25	22.013%	0.16	4.82	130.00	1.00	21.20
2019	Other	Active	6.47	0.341%	1.25	26.670%	0.03	1.73	130.00	1.00	3.58
2020	Other	Active	563.58	0.187%	1.13	28.373%	1.19	159.90	130.00	1.00	155.23
2021	Other	Active	122.97	0.033%	1.25	25.229%	0.05	31.02	130.00	1.00	6.58
2022	Other	Active	605.48	0.000%	1.21	15.346%	-	92.92	130.00	1.00	-
2023	Other	Active	863.80	0.000%	1.25	0.000%	-	0.00	130.00	1.00	-

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1965	Other	Inactive	-	0.335%	0.00	1.162%	-	-	130.00	1.00	-
1966	Other	Inactive	-	0.343%	0.00	1.185%	-	-	130.00	1.00	-
1967	Other	Inactive	-	0.352%	0.00	1.209%	-	-	130.00	1.00	-
1968	Other	Inactive	-	0.361%	0.00	1.234%	-	-	130.00	1.00	-
1969	Other	Inactive	-	0.370%	0.00	1.259%	-	-	130.00	1.00	-
1970	Other	Inactive	-	0.380%	0.00	1.285%	-	-	130.00	1.00	-
1971	Other	Inactive	-	0.390%	0.00	1.311%	-	-	130.00	1.00	-
1972	Other	Inactive	-	0.400%	0.00	1.338%	-	-	130.00	1.00	-
1973	Other	Inactive	-	0.410%	0.00	1.365%	-	-	130.00	1.00	-
1974	Other	Inactive	-	0.420%	0.00	1.393%	-	-	130.00	1.00	-
1975	Other	Inactive	-	0.431%	0.00	1.422%	-	-	130.00	1.00	-
1976	Other	Inactive	14.48	0.442%	1.25	1.451%	0.08	0.21	130.00	1.00	10.41
1977	Other	Inactive	-	0.454%	0.00	1.480%	-	-	130.00	1.00	-
1978	Other	Inactive	-	0.465%	0.00	1.510%	-	-	130.00	1.00	-
1979	Other	Inactive	7.25	0.477%	1.25	1.512%	0.04	0.11	130.00	1.00	5.62
1980	Other	Inactive	114.75	0.489%	0.55	1.494%	0.31	1.71	130.00	1.00	40.15
1981	Other	Inactive	707.84	0.502%	0.96	1.460%	3.40	10.34	130.00	1.00	442.61
1982	Other	Inactive	127.20	0.515%	0.90	1.412%	0.59	1.80	130.00	1.00	76.61
1983	Other	Inactive	1,078.40	0.528%	0.95	1.351%	5.41	14.57	130.00	1.00	703.17
1984	Other	Inactive	440.78	0.542%	0.90	1.279%	2.15	5.64	130.00	1.00	279.26
1985	Other	Inactive	1,198.15	0.555%	0.99	1.199%	6.57	14.36	130.00	1.00	854.27
1986	Other	Inactive	-	0.570%	0.00	1.112%	-	-	130.00	1.00	-
1987	Other	Inactive	-	0.584%	0.00	1.021%	-	-	130.00	1.00	-
1988	Other	Inactive	29.83	0.599%	1.25	0.928%	0.22	0.28	130.00	1.00	29.05
1989	Other	Inactive	414.41	0.615%	1.08	0.835%	2.74	3.46	130.00	1.00	355.93
1990	Other	Inactive	481.66	0.630%	1.13	0.743%	3.44	3.58	130.00	1.00	447.32
1991	Other	Inactive	-	0.647%	0.00	0.656%	-	-	130.00	1.00	-
1992	Other	Inactive	332.18	0.663%	1.13	0.574%	2.50	1.91	130.00	1.00	324.52
1993	Other	Inactive	163.11	0.680%	1.02	0.500%	1.13	0.82	130.00	1.00	146.61
1994	Other	Inactive	395.55	0.698%	1.08	0.437%	2.97	1.73	130.00	1.00	385.58
1995	Other	Inactive	641.22	0.715%	1.13	0.385%	5.20	2.47	130.00	1.00	675.87
1996	Other	Inactive	152.16	0.734%	0.55	0.347%	0.61	0.53	130.00	1.00	79.83
1997	Other	Inactive	5.95	0.753%	0.55	0.326%	0.02	0.02	130.00	1.00	3.20
1998	Other	Inactive	117.09	0.772%	0.55	0.323%	0.50	0.38	130.00	1.00	64.62
1999	Other	Inactive	-	0.792%	0.00	0.341%	-	-	130.00	1.00	-
2000	Other	Inactive	116.73	0.812%	0.55	0.380%	0.52	0.44	130.00	1.00	67.77
2001	Other	Inactive	144.00	0.833%	0.55	0.444%	0.66	0.64	130.00	1.00	85.74
2002	Other	Inactive	-	0.854%	0.00	0.535%	-	-	130.00	1.00	-
2003	Other	Inactive	-	0.876%	0.00	0.654%	-	-	130.00	1.00	-
2004	Other	Inactive	56.00	1.039%	1.25	0.804%	0.73	0.45	130.00	1.00	94.59
2005	Other	Inactive	50.69	1.223%	1.25	0.986%	0.78	0.50	130.00	1.00	100.77
2006	Other	Inactive	-	1.429%	0.00	1.204%	-	-	130.00	1.00	-
2007	Other	Inactive	-	1.657%	0.00	1.457%	-	-	130.00	1.00	-
2008	Other	Inactive	-	1.909%	0.00	1.750%	-	-	130.00	1.00	-
2009	Other	Inactive	19.80	2.186%	1.25	2.084%	0.54	0.41	130.00	1.00	70.34
2010	Other	Inactive	-	2.478%	0.00	2.460%	-	-	130.00	1.00	-
2011	Other	Inactive	-	2.758%	0.00	2.882%	-	-	130.00	1.00	-
2012	Other	Inactive	-	2.980%	0.00	3.350%	-	-	130.00	1.00	-
2013	Other	Inactive	-	3.104%	0.00	3.868%	-	-	130.00	1.00	-
2014	Other	Inactive	-	3.088%	0.00	4.437%	-	-	130.00	1.00	-
2015	Other	Inactive	-	2.890%	0.00	5.158%	-	-	130.00	1.00	-
2016	Other	Inactive	-	2.515%	0.00	6.737%	-	-	130.00	1.00	-
2017	Other	Inactive	-	1.968%	0.00	9.585%	-	-	130.00	1.00	-
2018	Other	Inactive	11.88	1.362%	1.25	12.949%	0.20	1.54	130.00	1.00	26.30
2019	Other	Inactive	-	0.779%	0.00	15.689%	-	-	130.00	1.00	-
2020	Other	Inactive	-	0.427%	0.00	16.690%	-	-	130.00	1.00	-
2021	Other	Inactive	-	0.075%	0.00	14.841%	-	-	130.00	1.00	-
2022	Other	Inactive	-	0.000%	0.00	9.027%	-	-	130.00	1.00	-
2023	Other	Inactive	-	0.000%	0.00	0.000%	-	-	130.00	1.00	-

West Virginia Department of Environmental Protection Office of Special Reclamation
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Water Operations & Maintenance Cost Projection - Deterministic Model

				2024							
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Forfeiture Rate (5)	Adjustment Factor Permit Bond Size (6)	Release Rate (7)	Forfeited Acres (8)	Released Acres (9)	Avg Recl Cost per Acre (10)	Adjustment Factor Permit Status (11)	Gross Cost (12)
1965	Other	Phased Released	-	0.387%	0.00	5.343%	-	-	130.00	1.00	-
1966	Other	Phased Released	-	0.397%	0.00	5.452%	-	-	130.00	1.00	-
1967	Other	Phased Released	-	0.407%	0.00	5.563%	-	-	130.00	1.00	-
1968	Other	Phased Released	-	0.418%	0.00	5.677%	-	-	130.00	1.00	-
1969	Other	Phased Released	-	0.428%	0.00	5.793%	-	-	130.00	1.00	-
1970	Other	Phased Released	-	0.439%	0.00	5.911%	-	-	130.00	1.00	-
1971	Other	Phased Released	-	0.451%	0.00	6.032%	-	-	130.00	1.00	-
1972	Other	Phased Released	-	0.462%	0.00	6.155%	-	-	130.00	1.00	-
1973	Other	Phased Released	9.00	0.474%	1.25	6.280%	0.05	0.57	130.00	1.00	6.93
1974	Other	Phased Released	-	0.486%	0.00	6.409%	-	-	130.00	1.00	-
1975	Other	Phased Released	-	0.499%	0.00	6.539%	-	-	130.00	1.00	-
1976	Other	Phased Released	27.88	0.511%	1.25	6.673%	0.18	1.86	130.00	1.00	23.17
1977	Other	Phased Released	-	0.524%	0.00	6.809%	-	-	130.00	1.00	-
1978	Other	Phased Released	12.76	0.538%	1.25	6.948%	0.09	0.89	130.00	1.00	11.15
1979	Other	Phased Released	58.69	0.552%	1.25	6.954%	0.40	4.08	130.00	1.00	52.61
1980	Other	Phased Released	7.91	0.566%	1.25	6.875%	0.06	0.54	130.00	1.00	7.27
1981	Other	Phased Released	475.54	0.580%	1.08	6.718%	2.97	31.95	130.00	1.00	385.67
1982	Other	Phased Released	201.26	0.595%	1.25	6.495%	1.50	13.07	130.00	1.00	194.66
1983	Other	Phased Released	158.90	0.610%	1.02	6.213%	0.99	9.87	130.00	1.00	128.21
1984	Other	Phased Released	75.79	0.626%	1.25	5.883%	0.59	4.46	130.00	1.00	77.11
1985	Other	Phased Released	43.00	0.642%	1.25	5.515%	0.35	2.37	130.00	1.00	44.87
1986	Other	Phased Released	-	0.659%	0.00	5.117%	-	-	130.00	1.00	-
1987	Other	Phased Released	-	0.676%	0.00	4.699%	-	-	130.00	1.00	-
1988	Other	Phased Released	-	0.693%	0.00	4.270%	-	-	130.00	1.00	-
1989	Other	Phased Released	62.20	0.711%	1.25	3.841%	0.55	2.39	130.00	1.00	71.83
1990	Other	Phased Released	-	0.729%	0.00	3.420%	-	-	130.00	1.00	-
1991	Other	Phased Released	-	0.748%	0.00	3.016%	-	-	130.00	1.00	-
1992	Other	Phased Released	-	0.767%	0.00	2.640%	-	-	130.00	1.00	-
1993	Other	Phased Released	-	0.786%	0.00	2.301%	-	-	130.00	1.00	-
1994	Other	Phased Released	-	0.807%	0.00	2.008%	-	-	130.00	1.00	-
1995	Other	Phased Released	-	0.827%	0.00	1.771%	-	-	130.00	1.00	-
1996	Other	Phased Released	-	0.848%	0.00	1.598%	-	-	130.00	1.00	-
1997	Other	Phased Released	31.16	0.870%	1.25	1.501%	0.34	0.47	130.00	1.00	44.06
1998	Other	Phased Released	-	0.892%	0.00	1.487%	-	-	130.00	1.00	-
1999	Other	Phased Released	179.00	0.915%	0.55	1.567%	0.90	2.80	130.00	1.00	117.15
2000	Other	Phased Released	-	0.939%	0.00	1.749%	-	-	130.00	1.00	-
2001	Other	Phased Released	-	0.963%	0.00	2.044%	-	-	130.00	1.00	-
2002	Other	Phased Released	-	0.988%	0.00	2.461%	-	-	130.00	1.00	-
2003	Other	Phased Released	-	1.013%	0.00	3.009%	-	-	130.00	1.00	-
2004	Other	Phased Released	-	1.202%	0.00	3.698%	-	-	130.00	1.00	-
2005	Other	Phased Released	-	1.415%	0.00	4.538%	-	-	130.00	1.00	-
2006	Other	Phased Released	-	1.652%	0.00	5.536%	-	-	130.00	1.00	-
2007	Other	Phased Released	-	1.916%	0.00	6.704%	-	-	130.00	1.00	-
2008	Other	Phased Released	9.90	2.208%	1.25	8.051%	0.27	0.80	130.00	1.00	35.52
2009	Other	Phased Released	-	2.528%	0.00	9.585%	-	-	130.00	1.00	-
2010	Other	Phased Released	-	2.865%	0.00	11.317%	-	-	130.00	1.00	-
2011	Other	Phased Released	-	3.189%	0.00	13.256%	-	-	130.00	1.00	-
2012	Other	Phased Released	-	3.446%	0.00	15.411%	-	-	130.00	1.00	-
2013	Other	Phased Released	-	3.589%	0.00	17.792%	-	-	130.00	1.00	-
2014	Other	Phased Released	-	3.571%	0.00	20.408%	-	-	130.00	1.00	-
2015	Other	Phased Released	115.00	3.342%	1.25	23.725%	4.80	27.28	130.00	1.00	624.51
2016	Other	Phased Released	-	2.908%	0.00	30.988%	-	-	130.00	1.00	-
2017	Other	Phased Released	-	2.276%	0.00	44.089%	-	-	130.00	1.00	-
2018	Other	Phased Released	-	1.575%	0.00	59.565%	-	-	130.00	1.00	-
2019	Other	Phased Released	-	0.901%	0.00	72.167%	-	-	130.00	1.00	-
2020	Other	Phased Released	-	0.494%	0.00	76.774%	-	-	130.00	1.00	-
2021	Other	Phased Released	-	0.087%	0.00	68.266%	-	-	130.00	1.00	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Operations & Maintenance Cost Projection - Deterministic N

				2025									
						Adjustment						Adjustment	
Permit			Current			Factor					Avg recl	Factor	
Issue	Mine	Mine	Bonded	Adjusted	Forfeiture	Permit	Release	Forfeited	Released	Cost per	Permit	Gross
Year	Type	Status	Acres	Acres	Rate	Bond Size	Rate	Acres	Acres	Acre	Status	Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Surface	Active	-	-	0.06%	-	0.82%	-	-	80.00	1	-
1966	Surface	Active	-	-	0.06%	-	0.82%	-	-	80.00	1	-
1967	Surface	Active	-	-	0.06%	-	0.86%	-	-	80.00	1	-
1968	Surface	Active	-	-	0.07%	-	0.89%	-	-	80.00	1	-
1969	Surface	Active	-	-	0.07%	-	0.93%	-	-	80.00	1	-
1970	Surface	Active	-	-	0.07%	-	0.97%	-	-	80.00	1	-
1971	Surface	Active	-	-	0.08%	-	1.01%	-	-	80.00	1	-
1972	Surface	Active	400.00	395.20	0.08%	1.25	1.05%	0.41	4.14	80.00	1	32.45
1973	Surface	Active	-	-	0.09%	-	1.09%	-	-	80.00	1	-
1974	Surface	Active	-	-	0.09%	-	1.14%	-	-	80.00	1	-
1975	Surface	Active	-	-	0.10%	-	1.19%	-	-	80.00	1	-
1976	Surface	Active	-	-	0.10%	-	1.23%	-	-	80.00	1	-
1977	Surface	Active	1,504.07	1,482.21	0.11%	1.02	1.29%	1.60	19.07	80.00	1	127.92
1978	Surface	Active	2,061.88	2,030.92	0.11%	0.90	1.34%	2.04	27.21	80.00	1	163.33
1979	Surface	Active	180.00	177.18	0.12%	0.90	1.40%	0.19	2.47	80.00	1	15.00
1980	Surface	Active	475.70	467.76	0.12%	0.90	1.45%	0.52	6.80	80.00	1	41.68
1981	Surface	Active	1,999.30	1,963.85	0.13%	0.94	1.55%	2.41	30.48	80.00	1	193.17
1982	Surface	Active	216.78	212.75	0.14%	0.90	1.64%	0.26	3.50	80.00	1	21.01
1983	Surface	Active	1,708.57	1,675.32	0.14%	0.90	1.73%	2.18	28.97	80.00	1	174.13
1984	Surface	Active	-	-	0.15%	-	1.81%	-	-	80.00	1	-
1985	Surface	Active	2,501.65	2,449.66	0.16%	0.76	1.88%	2.98	46.12	80.00	1	238.23
1986	Surface	Active	2,503.23	2,448.49	0.17%	0.99	1.95%	4.07	47.75	80.00	1	325.68
1987	Surface	Active	1,371.12	1,340.17	0.18%	1.02	2.01%	2.41	26.96	80.00	1	193.18
1988	Surface	Active	1,677.10	1,638.77	0.19%	0.86	2.07%	2.62	33.88	80.00	1	209.42
1989	Surface	Active	2,103.52	2,054.15	0.20%	0.90	2.12%	3.63	43.49	80.00	1	290.44
1990	Surface	Active	2,621.86	2,559.43	0.21%	0.84	2.16%	4.42	55.31	80.00	1	353.99
1991	Surface	Active	2,000.59	1,951.46	0.22%	0.98	2.20%	4.15	42.92	80.00	1	332.15
1992	Surface	Active	4,639.40	4,524.55	0.23%	0.90	2.23%	9.33	100.98	80.00	1	746.15
1993	Surface	Active	4,377.78	4,267.98	0.24%	0.90	2.26%	9.26	96.39	80.00	1	740.89
1994	Surface	Active	1,898.65	1,851.27	0.25%	0.75	2.28%	3.52	42.20	80.00	1	281.90
1995	Surface	Active	7,733.29	7,534.19	0.27%	0.96	2.30%	19.29	172.92	80.00	1	1,543.09
1996	Surface	Active	6,830.47	6,652.76	0.28%	0.99	2.31%	18.47	153.35	80.00	1	1,477.93
1997	Surface	Active	11,904.74	11,594.38	0.30%	0.96	2.31%	32.89	267.77	80.00	1	2,631.21
1998	Surface	Active	11,419.01	11,123.75	0.31%	0.87	2.31%	29.98	256.78	80.00	1	2,398.47
1999	Surface	Active	2,008.81	1,957.17	0.33%	0.81	2.30%	5.22	45.05	80.00	1	417.25
2000	Surface	Active	4,046.61	3,942.25	0.35%	0.84	2.29%	11.46	90.28	80.00	1	916.44
2001	Surface	Active	7,748.62	7,546.56	0.36%	0.93	2.27%	25.60	171.53	80.00	1	2,047.78
2002	Surface	Active	6,126.39	5,967.72	0.38%	0.93	2.25%	21.12	134.31	80.00	1	1,689.36
2003	Surface	Active	9,797.63	9,546.09	0.40%	0.92	2.22%	34.79	212.20	80.00	1	2,783.59
2004	Surface	Active	12,659.51	12,337.11	0.41%	0.93	2.19%	47.15	270.19	80.00	1	3,772.08
2005	Surface	Active	4,606.35	4,488.27	0.42%	1.04	2.15%	19.80	96.59	80.00	1	1,583.98
2006	Surface	Active	5,201.55	5,071.83	0.44%	0.96	2.11%	21.36	106.96	80.00	1	1,708.90
2007	Surface	Active	5,703.65	5,564.67	0.45%	0.93	2.06%	23.27	114.68	80.00	1	1,861.36
2008	Surface	Active	9,829.70	9,598.21	0.46%	0.86	2.01%	38.01	192.70	80.00	1	3,040.57
2009	Surface	Active	6,204.14	6,060.82	0.47%	0.88	1.95%	25.13	118.16	80.00	1	2,010.06
2010	Surface	Active	4,481.21	4,377.77	0.48%	1.00	1.89%	21.02	82.59	80.00	1	1,681.79
2011	Surface	Active	2,487.54	2,433.48	0.49%	0.85	1.82%	10.22	44.26	80.00	1	817.24
2012	Surface	Active	8,236.40	8,060.65	0.50%	0.92	1.75%	36.94	140.73	80.00	1	2,954.82
2013	Surface	Active	8,588.04	8,409.16	0.51%	0.96	1.67%	41.21	140.30	80.00	1	3,296.64
2014	Surface	Active	6,755.47	6,625.08	0.52%	0.83	1.59%	28.22	105.08	80.00	1	2,257.57
2015	Surface	Active	3,846.62	3,774.10	0.52%	0.90	1.50%	17.71	56.58	80.00	1	1,417.04
2016	Surface	Active	3,384.53	3,324.96	0.53%	0.86	1.41%	15.04	46.96	80.00	1	1,203.57
2017	Surface	Active	1,137.87	1,118.08	0.52%	1.08	1.31%	6.30	14.63	80.00	1	503.80
2018	Surface	Active	3,687.08	3,630.11	0.51%	1.03	1.19%	19.16	43.15	80.00	1	1,532.90
2019	Surface	Active	4,472.27	4,414.77	0.48%	0.94	1.05%	20.18	46.16	80.00	1	1,614.51
2020	Surface	Active	3,978.72	3,941.48	0.44%	0.74	0.87%	12.75	34.43	80.00	1	1,020.35
2021	Surface	Active	3,857.52	3,832.81	0.36%	0.85	0.67%	11.86	25.54	80.00	1	949.15
2022	Surface	Active	5,387.71	5,374.11	0.26%	1.04	0.42%	14.64	22.46	80.00	1	1,170.86
2023	Surface	Active	3,969.18	3,969.18	0.13%	0.99	0.12%	4.93	4.86	80.00	1	394.36

				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Surface	Inactive	-	-	0.14%	-	0.48%	-	-	80.00	1	-
1966	Surface	Inactive	-	-	0.14%	-	0.48%	-	-	80.00	1	-
1967	Surface	Inactive	-	-	0.15%	-	0.50%	-	-	80.00	1	-
1968	Surface	Inactive	-	-	0.15%	-	0.52%	-	-	80.00	1	-
1969	Surface	Inactive	-	-	0.16%	-	0.55%	-	-	80.00	1	-
1970	Surface	Inactive	-	-	0.17%	-	0.57%	-	-	80.00	1	-
1971	Surface	Inactive	-	-	0.18%	-	0.59%	-	-	80.00	1	-
1972	Surface	Inactive	-	-	0.19%	-	0.62%	-	-	80.00	1	-
1973	Surface	Inactive	-	-	0.20%	-	0.64%	-	-	80.00	1	-
1974	Surface	Inactive	-	-	0.21%	-	0.67%	-	-	80.00	1	-
1975	Surface	Inactive	-	-	0.22%	-	0.70%	-	-	80.00	1	-
1976	Surface	Inactive	438.80	434.89	0.23%	0.55	0.73%	0.55	3.16	80.00	1	44.09
1977	Surface	Inactive	-	-	0.24%	-	0.76%	-	-	80.00	1	-
1978	Surface	Inactive	-	-	0.26%	-	0.79%	-	-	80.00	1	-
1979	Surface	Inactive	-	-	0.27%	-	0.82%	-	-	80.00	1	-
1980	Surface	Inactive	-	-	0.28%	-	0.86%	-	-	80.00	1	-
1981	Surface	Inactive	-	-	0.30%	-	0.91%	-	-	80.00	1	-
1982	Surface	Inactive	-	-	0.31%	-	0.97%	-	-	80.00	1	-
1983	Surface	Inactive	-	-	0.33%	-	1.02%	-	-	80.00	1	-
1984	Surface	Inactive	-	-	0.35%	-	1.06%	-	-	80.00	1	-
1985	Surface	Inactive	-	-	0.37%	-	1.11%	-	-	80.00	1	-
1986	Surface	Inactive	411.07	404.71	0.38%	0.90	1.15%	1.40	4.64	80.00	1	112.14
1987	Surface	Inactive	415.61	408.65	0.41%	1.08	1.18%	1.78	4.84	80.00	1	142.37
1988	Surface	Inactive	1,304.38	1,282.87	0.43%	0.90	1.22%	4.92	15.60	80.00	1	393.87
1989	Surface	Inactive	176.00	173.01	0.45%	0.90	1.25%	0.70	2.15	80.00	1	55.91
1990	Surface	Inactive	70.12	69.02	0.47%	0.55	1.27%	0.18	0.88	80.00	1	14.35
1991	Surface	Inactive	-	-	0.50%	-	1.29%	-	-	80.00	1	-
1992	Surface	Inactive	-	-	0.52%	-	1.31%	-	-	80.00	1	-
1993	Surface	Inactive	-	-	0.55%	-	1.33%	-	-	80.00	1	-
1994	Surface	Inactive	-	-	0.58%	-	1.34%	-	-	80.00	1	-
1995	Surface	Inactive	2,098.71	2,058.11	0.61%	0.90	1.35%	11.31	27.79	80.00	1	904.84
1996	Surface	Inactive	-	-	0.64%	-	1.36%	-	-	80.00	1	-
1997	Surface	Inactive	-	-	0.68%	-	1.36%	-	-	80.00	1	-
1998	Surface	Inactive	846.89	829.71	0.71%	0.90	1.36%	5.32	11.27	80.00	1	425.46
1999	Surface	Inactive	1,733.11	1,692.67	0.75%	1.25	1.35%	15.86	22.92	80.00	1	1,268.96
2000	Surface	Inactive	-	-	0.79%	-	1.35%	-	-	80.00	1	-
2001	Surface	Inactive	-	-	0.83%	-	1.34%	-	-	80.00	1	-
2002	Surface	Inactive	1,146.85	1,123.70	0.87%	0.78	1.32%	7.70	14.88	80.00	1	615.74
2003	Surface	Inactive	1,161.50	1,136.72	0.91%	0.90	1.31%	9.28	14.86	80.00	1	742.43
2004	Surface	Inactive	3,700.97	3,621.82	0.94%	0.90	1.29%	30.60	46.66	80.00	1	2,448.35
2005	Surface	Inactive	-	-	0.97%	-	1.27%	-	-	80.00	1	-
2006	Surface	Inactive	244.59	240.24	1.00%	0.55	1.24%	1.32	2.98	80.00	1	105.60
2007	Surface	Inactive	1,080.24	1,061.22	1.03%	0.55	1.21%	6.00	12.86	80.00	1	479.62
2008	Surface	Inactive	118.60	115.64	1.05%	1.25	1.18%	1.52	1.37	80.00	1	121.87
2009	Surface	Inactive	680.43	668.75	1.08%	0.55	1.15%	3.97	7.67	80.00	1	317.52
2010	Surface	Inactive	1,146.11	1,120.00	1.10%	1.08	1.11%	13.28	12.43	80.00	1	1,062.05
2011	Surface	Inactive	1,088.67	1,067.73	1.12%	0.78	1.07%	9.40	11.42	80.00	1	752.37
2012	Surface	Inactive	-	-	1.14%	-	1.03%	-	-	80.00	1	-
2013	Surface	Inactive	93.44	91.96	1.16%	0.55	0.98%	0.59	0.90	80.00	1	47.03
2014	Surface	Inactive	415.42	407.30	1.18%	0.90	0.93%	4.32	3.80	80.00	1	345.53
2015	Surface	Inactive	1,156.30	1,137.44	1.19%	0.67	0.88%	9.04	10.03	80.00	1	723.08
2016	Surface	Inactive	776.75	764.03	1.20%	0.73	0.83%	6.65	6.35	80.00	1	532.22
2017	Surface	Inactive	154.63	151.92	1.20%	0.90	0.77%	1.64	1.17	80.00	1	131.00
2018	Surface	Inactive	351.08	345.42	1.17%	0.90	0.70%	3.64	2.42	80.00	1	290.97
2019	Surface	Inactive	452.10	445.72	1.11%	0.90	0.62%	4.44	2.74	80.00	1	355.30
2020	Surface	Inactive	-	-	1.00%	-	0.51%	-	-	80.00	1	-
2021	Surface	Inactive	-	-	0.83%	-	0.39%	-	-	80.00	1	-
2022	Surface	Inactive	-	-	0.60%	-	0.25%	-	-	80.00	1	-
2023	Surface	Inactive	-	-	0.29%	-	0.07%	-	-	80.00	1	-

				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Surface	Phased Released	-	-	0.16%	-	2.22%	-	-	80.00	1	-
1966	Surface	Phased Released	-	-	0.16%	-	2.22%	-	-	80.00	1	-
1967	Surface	Phased Released	-	-	0.17%	-	2.31%	-	-	80.00	1	-
1968	Surface	Phased Released	-	-	0.18%	-	2.41%	-	-	80.00	1	-
1969	Surface	Phased Released	-	-	0.19%	-	2.51%	-	-	80.00	1	-
1970	Surface	Phased Released	-	-	0.20%	-	2.62%	-	-	80.00	1	-
1971	Surface	Phased Released	-	-	0.21%	-	2.72%	-	-	80.00	1	-
1972	Surface	Phased Released	-	-	0.22%	-	2.84%	-	-	80.00	1	-
1973	Surface	Phased Released	-	-	0.23%	-	2.96%	-	-	80.00	1	-
1974	Surface	Phased Released	189.60	182.92	0.24%	1.25	3.08%	0.55	5.63	80.00	1	43.98
1975	Surface	Phased Released	7.80	7.51	0.25%	1.25	3.21%	0.02	0.24	80.00	1	1.90
1976	Surface	Phased Released	626.17	602.18	0.27%	1.25	3.34%	2.01	20.12	80.00	1	160.43
1977	Surface	Phased Released	48.00	46.08	0.28%	1.25	3.48%	0.16	1.60	80.00	1	12.92
1978	Surface	Phased Released	158.81	152.20	0.30%	1.25	3.63%	0.56	5.52	80.00	1	44.93
1979	Surface	Phased Released	358.00	342.45	0.31%	1.25	3.78%	1.33	12.93	80.00	1	106.41
1980	Surface	Phased Released	253.42	241.69	0.33%	1.25	3.93%	0.99	9.51	80.00	1	79.06
1981	Surface	Phased Released	1,785.41	1,699.53	0.34%	1.00	4.20%	5.85	71.37	80.00	1	468.13
1982	Surface	Phased Released	-	-	0.36%	-	4.45%	-	-	80.00	1	-
1983	Surface	Phased Released	302.61	286.28	0.38%	1.25	4.68%	1.37	13.40	80.00	1	109.22
1984	Surface	Phased Released	2,585.75	2,442.28	0.40%	1.08	4.90%	10.54	119.55	80.00	1	843.48
1985	Surface	Phased Released	1,270.29	1,198.17	0.42%	0.90	5.09%	4.56	61.04	80.00	1	364.68
1986	Surface	Phased Released	1,041.15	980.08	0.44%	0.90	5.28%	3.93	51.72	80.00	1	314.00
1987	Surface	Phased Released	760.81	714.87	0.47%	0.90	5.44%	3.01	38.91	80.00	1	241.09
1988	Surface	Phased Released	478.00	447.51	0.49%	1.25	5.59%	2.76	25.03	80.00	1	220.65
1989	Surface	Phased Released	1,098.64	1,027.73	0.52%	1.11	5.73%	5.92	58.88	80.00	1	473.65
1990	Surface	Phased Released	764.18	713.21	0.55%	1.25	5.85%	4.87	41.71	80.00	1	389.63
1991	Surface	Phased Released	1,006.45	939.76	0.58%	0.97	5.95%	5.24	55.93	80.00	1	419.37
1992	Surface	Phased Released	-	-	0.61%	-	6.04%	-	-	80.00	1	-
1993	Surface	Phased Released	562.59	523.17	0.64%	1.25	6.11%	4.17	31.97	80.00	1	333.36
1994	Surface	Phased Released	386.03	359.60	0.67%	0.90	6.17%	2.17	22.18	80.00	1	173.66
1995	Surface	Phased Released	484.30	450.01	0.71%	1.13	6.21%	3.60	27.95	80.00	1	288.07
1996	Surface	Phased Released	675.12	628.18	0.74%	0.90	6.24%	4.20	39.18	80.00	1	336.13
1997	Surface	Phased Released	969.50	900.36	0.78%	1.08	6.25%	7.57	56.26	80.00	1	605.74
1998	Surface	Phased Released	511.73	476.38	0.82%	0.78	6.25%	3.07	29.76	80.00	1	245.83
1999	Surface	Phased Released	14.87	13.78	0.87%	1.25	6.23%	0.15	0.86	80.00	1	11.94
2000	Surface	Phased Released	19.70	18.25	0.91%	1.25	6.20%	0.21	1.13	80.00	1	16.65
2001	Surface	Phased Released	491.55	456.56	0.96%	1.02	6.15%	4.46	28.08	80.00	1	356.66
2002	Surface	Phased Released	154.49	143.17	1.01%	1.25	6.09%	1.81	8.72	80.00	1	144.75
2003	Surface	Phased Released	-	-	1.05%	1.25	6.01%	-	-	80.00	1	-
2004	Surface	Phased Released	470.13	437.09	1.09%	1.08	5.93%	5.10	25.90	80.00	1	408.07
2005	Surface	Phased Released	51.50	47.82	1.12%	1.25	5.82%	0.67	2.78	80.00	1	53.61
2006	Surface	Phased Released	60.78	56.49	1.16%	1.25	5.71%	0.82	3.22	80.00	1	65.25
2007	Surface	Phased Released	186.68	175.29	1.19%	0.55	5.58%	1.14	9.77	80.00	1	91.60
2008	Surface	Phased Released	-	-	1.22%	-	5.43%	-	-	80.00	1	-
2009	Surface	Phased Released	220.84	207.03	1.25%	0.90	5.28%	2.32	10.92	80.00	1	185.98
2010	Surface	Phased Released	-	-	1.27%	-	5.10%	-	-	80.00	1	-
2011	Surface	Phased Released	214.01	200.36	1.30%	1.25	4.92%	3.26	9.86	80.00	1	260.49
2012	Surface	Phased Released	-	-	1.32%	-	4.72%	-	-	80.00	1	-
2013	Surface	Phased Released	-	-	1.34%	-	4.51%	-	-	80.00	1	-
2014	Surface	Phased Released	27.91	26.30	1.36%	1.25	4.29%	0.45	1.13	80.00	1	35.83
2015	Surface	Phased Released	-	-	1.38%	-	4.06%	-	-	80.00	1	-
2016	Surface	Phased Released	-	-	1.39%	-	3.82%	-	-	80.00	1	-
2017	Surface	Phased Released	-	-	1.38%	-	3.54%	-	-	80.00	1	-
2018	Surface	Phased Released	-	-	1.35%	-	3.22%	-	-	80.00	1	-
2019	Surface	Phased Released	-	-	1.28%	-	2.83%	-	-	80.00	1	-
2020	Surface	Phased Released	-	-	1.15%	-	2.36%	-	-	80.00	1	-
2021	Surface	Phased Released	-	-	0.96%	-	1.80%	-	-	80.00	1	-
2022	Surface	Phased Released	-	-	0.69%	-	1.13%	-	-	80.00	1	-
2023	Surface	Phased Released	-	-	0.33%	-	0.33%	-	-	80.00	1	-

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				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Underground	Active	-	-	0.10%	-	0.59%	-	-	135.00	1	-
1966	Underground	Active	-	-	0.10%	-	0.59%	-	-	135.00	1	-
1967	Underground	Active	-	-	0.10%	-	0.62%	-	-	135.00	1	-
1968	Underground	Active	-	-	0.11%	-	0.64%	-	-	135.00	1	-
1969	Underground	Active	-	-	0.11%	-	0.67%	-	-	135.00	1	-
1970	Underground	Active	-	-	0.11%	-	0.70%	-	-	135.00	1	-
1971	Underground	Active	-	-	0.12%	-	0.73%	-	-	135.00	1	-
1972	Underground	Active	-	-	0.12%	-	0.76%	-	-	135.00	1	-
1973	Underground	Active	-	-	0.12%	-	0.79%	-	-	135.00	1	-
1974	Underground	Active	-	-	0.12%	-	0.82%	-	-	135.00	1	-
1975	Underground	Active	-	-	0.13%	-	0.86%	-	-	135.00	1	-
1976	Underground	Active	-	-	0.13%	-	0.89%	-	-	135.00	1	-
1977	Underground	Active	-	-	0.13%	-	0.93%	-	-	135.00	1	-
1978	Underground	Active	-	-	0.14%	-	0.97%	-	-	135.00	1	-
1979	Underground	Active	755.59	745.53	0.14%	1.03	1.08%	1.08	8.02	135.00	1	146.27
1980	Underground	Active	222.16	218.97	0.14%	0.97	1.18%	0.31	2.59	135.00	1	41.45
1981	Underground	Active	720.89	709.54	0.15%	1.17	1.29%	1.23	9.15	135.00	1	165.81
1982	Underground	Active	80.68	79.34	0.15%	1.02	1.40%	0.12	1.11	135.00	1	16.56
1983	Underground	Active	7,126.06	7,001.03	0.16%	0.91	1.50%	9.96	105.24	135.00	1	1,344.30
1984	Underground	Active	2,930.46	2,875.35	0.16%	1.02	1.61%	4.71	46.26	135.00	1	635.47
1985	Underground	Active	49.00	48.01	0.16%	1.25	1.71%	0.10	0.82	135.00	1	13.29
1986	Underground	Active	252.11	246.80	0.17%	1.11	1.82%	0.46	4.48	135.00	1	62.22
1987	Underground	Active	203.45	198.95	0.17%	1.11	1.92%	0.38	3.81	135.00	1	51.45
1988	Underground	Active	179.01	174.88	0.18%	1.11	2.01%	0.34	3.52	135.00	1	46.38
1989	Underground	Active	124.25	121.23	0.18%	1.25	2.11%	0.28	2.56	135.00	1	37.14
1990	Underground	Active	131.40	128.13	0.19%	1.08	2.20%	0.26	2.82	135.00	1	34.62
1991	Underground	Active	35.30	34.38	0.19%	1.25	2.29%	0.08	0.79	135.00	1	11.08
1992	Underground	Active	1,073.06	1,044.71	0.20%	0.96	2.37%	1.96	24.76	135.00	1	264.72
1993	Underground	Active	974.28	947.66	0.20%	1.02	2.45%	1.94	23.21	135.00	1	261.27
1994	Underground	Active	756.33	735.15	0.21%	0.99	2.52%	1.50	18.55	135.00	1	201.92
1995	Underground	Active	273.19	265.32	0.21%	1.02	2.59%	0.57	6.88	135.00	1	76.95
1996	Underground	Active	242.74	235.56	0.22%	1.04	2.65%	0.55	6.25	135.00	1	74.09
1997	Underground	Active	239.17	231.92	0.24%	1.09	2.71%	0.60	6.29	135.00	1	80.61
1998	Underground	Active	558.33	541.24	0.25%	0.99	2.76%	1.33	14.94	135.00	1	179.56
1999	Underground	Active	117.00	113.28	0.26%	1.25	2.80%	0.37	3.18	135.00	1	49.87
2000	Underground	Active	281.79	272.85	0.27%	1.08	2.84%	0.80	7.75	135.00	1	107.94
2001	Underground	Active	224.71	217.67	0.28%	0.83	2.87%	0.51	6.24	135.00	1	69.25
2002	Underground	Active	265.26	256.63	0.29%	1.16	2.89%	0.88	7.41	135.00	1	118.73
2003	Underground	Active	998.12	965.54	0.31%	1.15	2.90%	3.40	27.98	135.00	1	459.31
2004	Underground	Active	460.97	446.14	0.32%	1.00	2.90%	1.41	12.94	135.00	1	189.75
2005	Underground	Active	325.84	315.44	0.32%	0.95	2.89%	0.97	9.12	135.00	1	131.19
2006	Underground	Active	433.77	420.19	0.33%	0.83	2.88%	1.16	12.08	135.00	1	156.73
2007	Underground	Active	594.07	575.10	0.34%	1.10	2.85%	2.16	16.38	135.00	1	292.11
2008	Underground	Active	107.24	103.80	0.35%	1.25	2.81%	0.45	2.92	135.00	1	60.94
2009	Underground	Active	344.39	333.98	0.35%	0.90	2.76%	1.06	9.22	135.00	1	143.72
2010	Underground	Active	241.30	233.94	0.36%	1.16	2.70%	0.98	6.32	135.00	1	132.02
2011	Underground	Active	201.31	195.34	0.36%	1.15	2.63%	0.82	5.13	135.00	1	110.42
2012	Underground	Active	220.12	213.88	0.37%	1.05	2.54%	0.83	5.44	135.00	1	111.45
2013	Underground	Active	495.72	482.26	0.37%	1.03	2.45%	1.83	11.79	135.00	1	246.98
2014	Underground	Active	752.00	732.41	0.37%	1.06	2.33%	2.88	17.10	135.00	1	389.02
2015	Underground	Active	157.00	153.08	0.37%	1.15	2.21%	0.65	3.38	135.00	1	88.35
2016	Underground	Active	135.36	132.14	0.37%	1.25	2.07%	0.61	2.74	135.00	1	82.25
2017	Underground	Active	161.03	157.50	0.36%	1.25	1.92%	0.72	3.03	135.00	1	96.64
2018	Underground	Active	52.55	51.51	0.35%	1.25	1.75%	0.23	0.90	135.00	1	30.53
2019	Underground	Active	149.13	146.61	0.33%	1.08	1.57%	0.52	2.31	135.00	1	69.94
2020	Underground	Active	126.64	124.79	0.29%	1.25	1.38%	0.46	1.72	135.00	1	61.72
2021	Underground	Active	76.97	76.09	0.24%	1.25	1.16%	0.23	0.88	135.00	1	31.01
2022	Underground	Active	43.22	42.88	0.17%	1.25	0.93%	0.09	0.40	135.00	1	12.36
2023	Underground	Active	69.14	68.85	0.08%	1.25	0.69%	0.07	0.47	135.00	1	9.10

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				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Underground	Inactive	-	-	0.23%	-	0.35%	-	-	135.00	1	-
1966	Underground	Inactive	-	-	0.23%	-	0.35%	-	-	135.00	1	-
1967	Underground	Inactive	-	-	0.24%	-	0.36%	-	-	135.00	1	-
1968	Underground	Inactive	-	-	0.24%	-	0.38%	-	-	135.00	1	-
1969	Underground	Inactive	-	-	0.25%	-	0.40%	-	-	135.00	1	-
1970	Underground	Inactive	-	-	0.26%	-	0.41%	-	-	135.00	1	-
1971	Underground	Inactive	-	-	0.26%	-	0.43%	-	-	135.00	1	-
1972	Underground	Inactive	-	-	0.27%	-	0.45%	-	-	135.00	1	-
1973	Underground	Inactive	-	-	0.28%	-	0.47%	-	-	135.00	1	-
1974	Underground	Inactive	-	-	0.28%	-	0.48%	-	-	135.00	1	-
1975	Underground	Inactive	-	-	0.29%	-	0.50%	-	-	135.00	1	-
1976	Underground	Inactive	26.50	26.31	0.30%	0.55	0.53%	0.04	0.14	135.00	1	5.83
1977	Underground	Inactive	-	-	0.31%	-	0.55%	-	-	135.00	1	-
1978	Underground	Inactive	117.89	116.93	0.31%	0.55	0.57%	0.20	0.67	135.00	1	27.27
1979	Underground	Inactive	-	-	0.32%	-	0.63%	-	-	135.00	1	-
1980	Underground	Inactive	-	-	0.33%	-	0.70%	-	-	135.00	1	-
1981	Underground	Inactive	189.58	187.54	0.34%	0.73	0.76%	0.46	1.42	135.00	1	62.20
1982	Underground	Inactive	72.51	71.73	0.35%	0.55	0.82%	0.14	0.59	135.00	1	18.51
1983	Underground	Inactive	285.25	281.73	0.36%	0.78	0.88%	0.79	2.49	135.00	1	106.20
1984	Underground	Inactive	-	-	0.37%	-	0.95%	-	-	135.00	1	-
1985	Underground	Inactive	220.21	217.10	0.37%	0.90	1.01%	0.73	2.19	135.00	1	98.90
1986	Underground	Inactive	43.54	42.95	0.38%	0.55	1.07%	0.09	0.46	135.00	1	12.27
1987	Underground	Inactive	40.89	40.31	0.39%	0.55	1.13%	0.09	0.45	135.00	1	11.81
1988	Underground	Inactive	73.42	72.15	0.40%	1.19	1.18%	0.35	0.85	135.00	1	46.95
1989	Underground	Inactive	193.50	190.54	0.41%	0.55	1.24%	0.43	2.36	135.00	1	58.70
1990	Underground	Inactive	47.64	46.78	0.43%	1.08	1.29%	0.21	0.61	135.00	1	28.89
1991	Underground	Inactive	362.42	355.72	0.44%	1.02	1.35%	1.58	4.79	135.00	1	213.10
1992	Underground	Inactive	9.00	8.82	0.45%	1.25	1.39%	0.05	0.12	135.00	1	6.66
1993	Underground	Inactive	35.86	35.18	0.46%	0.90	1.44%	0.15	0.51	135.00	1	19.62
1994	Underground	Inactive	100.78	98.98	0.47%	0.55	1.48%	0.26	1.47	135.00	1	34.61
1995	Underground	Inactive	182.46	178.99	0.48%	0.67	1.52%	0.58	2.73	135.00	1	77.80
1996	Underground	Inactive	55.21	53.96	0.51%	1.25	1.56%	0.35	0.84	135.00	1	46.62
1997	Underground	Inactive	282.76	276.53	0.54%	1.02	1.59%	1.52	4.41	135.00	1	205.21
1998	Underground	Inactive	72.14	70.56	0.57%	0.90	1.62%	0.36	1.15	135.00	1	48.77
1999	Underground	Inactive	606.66	592.33	0.60%	1.11	1.65%	3.92	9.77	135.00	1	529.31
2000	Underground	Inactive	256.24	249.98	0.62%	1.16	1.67%	1.81	4.18	135.00	1	244.45
2001	Underground	Inactive	6.00	5.85	0.65%	1.25	1.69%	0.05	0.10	135.00	1	6.40
2002	Underground	Inactive	47.21	46.11	0.67%	0.90	1.70%	0.28	0.78	135.00	1	37.75
2003	Underground	Inactive	212.02	207.24	0.70%	0.76	1.70%	1.10	3.53	135.00	1	148.33
2004	Underground	Inactive	180.23	176.43	0.72%	0.55	1.71%	0.70	3.01	135.00	1	94.33
2005	Underground	Inactive	124.90	121.73	0.74%	1.11	1.70%	1.00	2.07	135.00	1	135.21
2006	Underground	Inactive	160.75	156.78	0.76%	1.02	1.69%	1.21	2.65	135.00	1	163.73
2007	Underground	Inactive	107.80	105.35	0.78%	0.78	1.68%	0.64	1.76	135.00	1	86.77
2008	Underground	Inactive	79.05	76.97	0.80%	1.25	1.65%	0.76	1.27	135.00	1	103.27
2009	Underground	Inactive	111.36	108.54	0.81%	1.15	1.62%	1.01	1.76	135.00	1	136.41
2010	Underground	Inactive	161.54	157.47	0.82%	1.17	1.59%	1.52	2.50	135.00	1	204.82
2011	Underground	Inactive	129.26	126.08	0.83%	1.15	1.55%	1.21	1.95	135.00	1	162.89
2012	Underground	Inactive	32.84	32.21	0.84%	0.55	1.50%	0.15	0.48	135.00	1	20.10
2013	Underground	Inactive	44.71	43.62	0.85%	1.25	1.44%	0.46	0.63	135.00	1	62.27
2014	Underground	Inactive	12.00	11.72	0.85%	1.25	1.37%	0.12	0.16	135.00	1	16.79
2015	Underground	Inactive	16.83	16.45	0.85%	1.25	1.30%	0.17	0.21	135.00	1	23.58
2016	Underground	Inactive	13.42	13.13	0.84%	1.25	1.22%	0.14	0.16	135.00	1	18.68
2017	Underground	Inactive	-	-	0.83%	-	1.13%	-	-	135.00	1	-
2018	Underground	Inactive	37.86	37.15	0.80%	1.25	1.03%	0.37	0.38	135.00	1	50.33
2019	Underground	Inactive	-	-	0.75%	-	0.92%	-	-	135.00	1	-
2020	Underground	Inactive	-	-	0.67%	-	0.81%	-	-	135.00	1	-
2021	Underground	Inactive	-	-	0.55%	-	0.68%	-	-	135.00	1	-
2022	Underground	Inactive	-	-	0.39%	-	0.55%	-	-	135.00	1	-
2023	Underground	Inactive	-	-	0.18%	-	0.40%	-	-	135.00	1	-

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				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Underground	Phased Released	-	-	0.27%	-	1.61%	-	-	135.00	1	-
1966	Underground	Phased Released	-	-	0.27%	-	1.61%	-	-	135.00	1	-
1967	Underground	Phased Released	-	-	0.27%	-	1.68%	-	-	135.00	1	-
1968	Underground	Phased Released	-	-	0.28%	-	1.75%	-	-	135.00	1	-
1969	Underground	Phased Released	-	-	0.29%	-	1.82%	-	-	135.00	1	-
1970	Underground	Phased Released	-	-	0.30%	-	1.89%	-	-	135.00	1	-
1971	Underground	Phased Released	-	-	0.30%	-	1.97%	-	-	135.00	1	-
1972	Underground	Phased Released	-	-	0.31%	-	2.05%	-	-	135.00	1	-
1973	Underground	Phased Released	-	-	0.32%	-	2.14%	-	-	135.00	1	-
1974	Underground	Phased Released	-	-	0.33%	-	2.23%	-	-	135.00	1	-
1975	Underground	Phased Released	-	-	0.34%	-	2.32%	-	-	135.00	1	-
1976	Underground	Phased Released	-	-	0.35%	-	2.42%	-	-	135.00	1	-
1977	Underground	Phased Released	-	-	0.35%	-	2.52%	-	-	135.00	1	-
1978	Underground	Phased Released	10.58	10.22	0.36%	1.25	2.63%	0.05	0.27	135.00	1	6.26
1979	Underground	Phased Released	59.68	57.48	0.37%	1.25	2.91%	0.27	1.67	135.00	1	36.13
1980	Underground	Phased Released	87.19	83.72	0.38%	1.25	3.20%	0.40	2.68	135.00	1	53.97
1981	Underground	Phased Released	66.33	63.52	0.39%	1.13	3.49%	0.28	2.22	135.00	1	38.08
1982	Underground	Phased Released	194.36	185.45	0.40%	1.25	3.78%	0.93	7.01	135.00	1	125.76
1983	Underground	Phased Released	70.38	66.94	0.41%	1.25	4.07%	0.34	2.72	135.00	1	46.56
1984	Underground	Phased Released	80.60	76.67	0.42%	0.55	4.35%	0.18	3.34	135.00	1	24.06
1985	Underground	Phased Released	17.24	16.30	0.43%	1.25	4.63%	0.09	0.76	135.00	1	11.92
1986	Underground	Phased Released	118.96	112.12	0.44%	1.25	4.91%	0.62	5.51	135.00	1	84.13
1987	Underground	Phased Released	67.09	63.04	0.46%	1.25	5.18%	0.36	3.27	135.00	1	48.52
1988	Underground	Phased Released	197.49	185.04	0.47%	1.25	5.45%	1.08	10.08	135.00	1	146.06
1989	Underground	Phased Released	80.68	75.38	0.48%	1.25	5.70%	0.45	4.30	135.00	1	61.03
1990	Underground	Phased Released	18.31	17.06	0.49%	1.25	5.95%	0.10	1.02	135.00	1	14.17
1991	Underground	Phased Released	23.22	21.58	0.50%	1.25	6.19%	0.14	1.34	135.00	1	18.38
1992	Underground	Phased Released	39.95	37.04	0.52%	1.25	6.41%	0.24	2.38	135.00	1	32.35
1993	Underground	Phased Released	68.38	63.25	0.53%	1.25	6.63%	0.42	4.19	135.00	1	56.66
1994	Underground	Phased Released	18.79	17.34	0.54%	1.25	6.83%	0.12	1.18	135.00	1	15.93
1995	Underground	Phased Released	60.54	55.74	0.56%	1.25	7.01%	0.39	3.91	135.00	1	52.53
1996	Underground	Phased Released	133.37	122.54	0.59%	1.25	7.18%	0.91	8.80	135.00	1	122.43
1997	Underground	Phased Released	119.99	110.04	0.63%	1.25	7.34%	0.86	8.07	135.00	1	116.09
1998	Underground	Phased Released	64.00	58.59	0.66%	1.25	7.47%	0.48	4.38	135.00	1	65.03
1999	Underground	Phased Released	246.00	225.50	0.69%	0.90	7.59%	1.40	17.11	135.00	1	188.92
2000	Underground	Phased Released	59.65	54.46	0.72%	1.25	7.68%	0.49	4.18	135.00	1	66.21
2001	Underground	Phased Released	36.60	33.38	0.75%	1.25	7.76%	0.31	2.59	135.00	1	42.27
2002	Underground	Phased Released	48.55	44.25	0.78%	1.25	7.81%	0.43	3.46	135.00	1	58.18
2003	Underground	Phased Released	31.05	28.29	0.81%	1.25	7.84%	0.29	2.22	135.00	1	38.51
2004	Underground	Phased Released	-	-	0.83%	-	7.85%	-	-	135.00	1	-
2005	Underground	Phased Released	21.73	19.80	0.86%	1.25	7.83%	0.21	1.55	135.00	1	28.64
2006	Underground	Phased Released	-	-	0.88%	-	7.78%	-	-	135.00	1	-
2007	Underground	Phased Released	-	-	0.90%	-	7.71%	-	-	135.00	1	-
2008	Underground	Phased Released	63.64	58.14	0.92%	1.25	7.60%	0.67	4.42	135.00	1	90.20
2009	Underground	Phased Released	54.60	49.96	0.94%	1.25	7.47%	0.58	3.73	135.00	1	78.92
2010	Underground	Phased Released	-	-	0.95%	-	7.31%	-	-	135.00	1	-
2011	Underground	Phased Released	25.60	23.53	0.96%	1.25	7.11%	0.28	1.67	135.00	1	38.20
2012	Underground	Phased Released	-	-	0.97%	-	6.88%	-	-	135.00	1	-
2013	Underground	Phased Released	-	-	0.98%	-	6.62%	-	-	135.00	1	-
2014	Underground	Phased Released	-	-	0.98%	-	6.32%	-	-	135.00	1	-
2015	Underground	Phased Released	-	-	0.98%	-	5.98%	-	-	135.00	1	-
2016	Underground	Phased Released	-	-	0.97%	-	5.61%	-	-	135.00	1	-
2017	Underground	Phased Released	-	-	0.96%	-	5.20%	-	-	135.00	1	-
2018	Underground	Phased Released	-	-	0.93%	-	4.75%	-	-	135.00	1	-
2019	Underground	Phased Released	-	-	0.87%	-	4.25%	-	-	135.00	1	-
2020	Underground	Phased Released	-	-	0.77%	-	3.72%	-	-	135.00	1	-
2021	Underground	Phased Released	-	-	0.64%	-	3.14%	-	-	135.00	1	-
2022	Underground	Phased Released	-	-	0.45%	-	2.52%	-	-	135.00	1	-
2023	Underground	Phased Released	-	-	0.21%	-	1.86%	-	-	135.00	1	-

				2025									
Permit Issue Year	Mine Type	Mine Status	Current Bonded Acres	Adjusted Acres	Forfeiture Rate	Adjustment Factor Permit Bond Size	Release Rate	Forfeited Acres	Released Acres	Avg recl Cost per Acre	Adjustment Factor Permit Status	Gross Cost
(1)	(2)	(3)	(4)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1965	Other	Active	-	-	0.15%	-	1.97%	-	-	130.00	1	-
1966	Other	Active	-	-	0.15%	-	1.97%	-	-	130.00	1	-
1967	Other	Active	-	-	0.15%	-	2.01%	-	-	130.00	1	-
1968	Other	Active	-	-	0.15%	-	2.06%	-	-	130.00	1	-
1969	Other	Active	-	-	0.16%	-	2.10%	-	-	130.00	1	-
1970	Other	Active	-	-	0.16%	-	2.14%	-	-	130.00	1	-
1971	Other	Active	-	-	0.17%	-	2.18%	-	-	130.00	1	-
1972	Other	Active	20.00	19.50	0.17%	1.25	2.23%	0.04	0.43	130.00	1	5.40
1973	Other	Active	-	-	0.17%	-	2.27%	-	-	130.00	1	-
1974	Other	Active	28.52	27.78	0.18%	1.25	2.32%	0.06	0.64	130.00	1	8.09
1975	Other	Active	6.20	6.04	0.18%	1.25	2.37%	0.01	0.14	130.00	1	1.80
1976	Other	Active	-	-	0.19%	-	2.42%	-	-	130.00	1	-
1977	Other	Active	223.99	217.88	0.19%	1.08	2.47%	0.45	5.37	130.00	1	58.91
1978	Other	Active	-	-	0.20%	-	2.52%	-	-	130.00	1	-
1979	Other	Active	65.00	63.16	0.20%	1.25	2.57%	0.16	1.62	130.00	1	20.89
1980	Other	Active	364.74	354.65	0.21%	1.05	2.57%	0.78	9.11	130.00	1	101.05
1981	Other	Active	5,211.96	5,072.15	0.21%	0.91	2.54%	9.87	128.86	130.00	1	1,283.52
1982	Other	Active	586.43	571.17	0.22%	0.90	2.48%	1.13	14.18	130.00	1	146.74
1983	Other	Active	3,861.09	3,764.75	0.23%	0.86	2.40%	7.30	90.36	130.00	1	949.15
1984	Other	Active	4,421.79	4,317.64	0.23%	0.76	2.30%	7.62	99.14	130.00	1	991.21
1985	Other	Active	1,543.19	1,507.86	0.24%	1.03	2.17%	3.70	32.79	130.00	1	480.47
1986	Other	Active	1,384.69	1,355.21	0.24%	0.95	2.04%	3.14	27.62	130.00	1	408.33
1987	Other	Active	974.10	954.69	0.25%	1.00	1.89%	2.38	18.05	130.00	1	309.30
1988	Other	Active	618.27	606.80	0.26%	1.06	1.74%	1.64	10.54	130.00	1	212.84
1989	Other	Active	290.43	285.41	0.26%	1.15	1.58%	0.86	4.50	130.00	1	111.86
1990	Other	Active	344.46	339.19	0.27%	0.97	1.42%	0.88	4.81	130.00	1	115.00
1991	Other	Active	491.29	484.16	0.28%	1.19	1.26%	1.59	6.12	130.00	1	206.84
1992	Other	Active	391.14	386.14	0.28%	1.04	1.11%	1.14	4.30	130.00	1	147.67
1993	Other	Active	946.05	935.77	0.29%	0.80	0.98%	2.16	9.13	130.00	1	280.56
1994	Other	Active	2,315.41	2,292.06	0.30%	0.87	0.85%	5.95	19.49	130.00	1	774.04
1995	Other	Active	950.69	941.27	0.31%	1.08	0.74%	3.09	6.98	130.00	1	401.43
1996	Other	Active	1,971.02	1,954.42	0.31%	0.78	0.65%	4.79	12.79	130.00	1	622.94
1997	Other	Active	1,403.71	1,391.77	0.32%	0.90	0.59%	4.02	8.22	130.00	1	522.74
1998	Other	Active	1,144.42	1,134.11	0.33%	1.04	0.55%	3.88	6.29	130.00	1	504.85
1999	Other	Active	404.95	401.25	0.34%	0.97	0.55%	1.31	2.20	130.00	1	170.86
2000	Other	Active	222.50	220.35	0.35%	0.90	0.58%	0.69	1.28	130.00	1	89.29
2001	Other	Active	381.08	377.05	0.36%	0.83	0.65%	1.11	2.44	130.00	1	144.52
2002	Other	Active	818.79	807.79	0.36%	1.16	0.76%	3.42	6.10	130.00	1	444.77
2003	Other	Active	908.39	894.34	0.37%	1.13	0.91%	3.79	8.13	130.00	1	492.39
2004	Other	Active	1,149.70	1,128.82	0.38%	0.99	1.11%	4.27	12.55	130.00	1	555.40
2005	Other	Active	23.99	23.47	0.45%	0.90	1.37%	0.10	0.32	130.00	1	12.49
2006	Other	Active	491.96	478.82	0.54%	1.00	1.68%	2.56	8.03	130.00	1	333.17
2007	Other	Active	394.47	381.62	0.63%	1.08	2.05%	2.56	7.81	130.00	1	333.43
2008	Other	Active	599.63	576.28	0.73%	1.10	2.48%	4.60	14.28	130.00	1	597.53
2009	Other	Active	174.78	166.79	0.84%	1.08	2.98%	1.50	4.96	130.00	1	194.72
2010	Other	Active	1,066.83	1,010.90	0.96%	0.98	3.54%	9.45	35.81	130.00	1	1,229.05
2011	Other	Active	365.79	343.90	1.08%	0.90	4.18%	3.36	14.38	130.00	1	436.25
2012	Other	Active	213.57	198.17	1.21%	1.16	4.90%	2.78	9.71	130.00	1	361.35
2013	Other	Active	2,100.30	1,933.76	1.30%	1.00	5.70%	25.14	110.13	130.00	1	3,268.79
2014	Other	Active	282.83	256.89	1.36%	1.21	6.58%	4.21	16.89	130.00	1	547.10
2015	Other	Active	1,105.29	992.54	1.35%	1.13	7.54%	15.20	74.86	130.00	1	1,975.65
2016	Other	Active	1,513.50	1,321.30	1.26%	1.13	8.77%	18.94	115.85	130.00	1	2,461.58
2017	Other	Active	385.95	319.30	1.10%	1.13	11.45%	3.98	36.57	130.00	1	517.68
2018	Other	Active	21.89	16.91	0.86%	1.25	16.29%	0.18	2.75	130.00	1	23.66
2019	Other	Active	6.47	4.72	0.60%	1.25	22.01%	0.04	1.04	130.00	1	4.57
2020	Other	Active	563.58	402.48	0.34%	1.13	26.67%	1.56	107.34	130.00	1	202.20
2021	Other	Active	122.97	91.90	0.19%	1.25	28.37%	0.21	26.07	130.00	1	27.92
2022	Other	Active	605.48	512.56	0.03%	1.21	25.23%	0.20	129.31	130.00	1	26.56
2023	Other	Active	863.80	863.80	0.00%	1.25	15.35%	-	132.56	130.00	1	-

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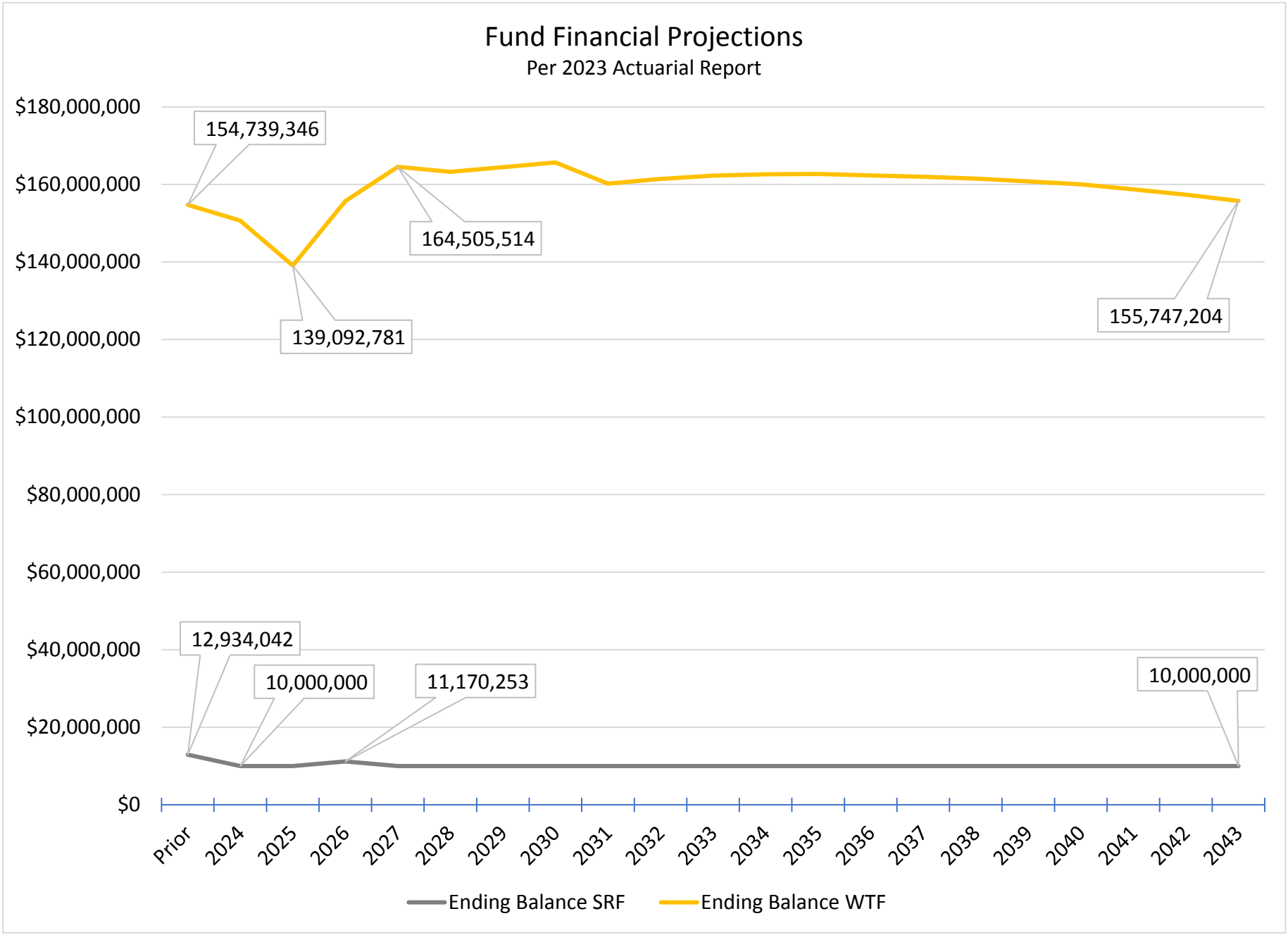
				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Other	Inactive	-	-	0.33%	-	1.16%	-	-	130.00	1	-
1966	Other	Inactive	-	-	0.33%	-	1.16%	-	-	130.00	1	-
1967	Other	Inactive	-	-	0.34%	-	1.19%	-	-	130.00	1	-
1968	Other	Inactive	-	-	0.35%	-	1.21%	-	-	130.00	1	-
1969	Other	Inactive	-	-	0.36%	-	1.23%	-	-	130.00	1	-
1970	Other	Inactive	-	-	0.37%	-	1.26%	-	-	130.00	1	-
1971	Other	Inactive	-	-	0.38%	-	1.29%	-	-	130.00	1	-
1972	Other	Inactive	-	-	0.39%	-	1.31%	-	-	130.00	1	-
1973	Other	Inactive	-	-	0.40%	-	1.34%	-	-	130.00	1	-
1974	Other	Inactive	-	-	0.41%	-	1.37%	-	-	130.00	1	-
1975	Other	Inactive	-	-	0.42%	-	1.39%	-	-	130.00	1	-
1976	Other	Inactive	14.48	14.19	0.43%	1.25	1.42%	0.08	0.20	130.00	1	9.94
1977	Other	Inactive	-	-	0.44%	-	1.45%	-	-	130.00	1	-
1978	Other	Inactive	-	-	0.45%	-	1.48%	-	-	130.00	1	-
1979	Other	Inactive	7.25	7.10	0.47%	1.25	1.51%	0.04	0.11	130.00	1	5.37
1980	Other	Inactive	114.75	112.73	0.48%	0.55	1.51%	0.30	1.70	130.00	1	38.46
1981	Other	Inactive	707.84	694.10	0.49%	0.96	1.49%	3.26	10.37	130.00	1	423.16
1982	Other	Inactive	127.20	124.81	0.50%	0.90	1.46%	0.56	1.82	130.00	1	73.29
1983	Other	Inactive	1,078.40	1,058.43	0.51%	0.95	1.41%	5.18	14.94	130.00	1	672.89
1984	Other	Inactive	440.78	432.99	0.53%	0.90	1.35%	2.06	5.85	130.00	1	267.47
1985	Other	Inactive	1,198.15	1,177.21	0.54%	0.99	1.28%	6.30	15.06	130.00	1	818.36
1986	Other	Inactive	-	-	0.56%	-	1.20%	-	-	130.00	1	-
1987	Other	Inactive	-	-	0.57%	-	1.11%	-	-	130.00	1	-
1988	Other	Inactive	29.83	29.33	0.58%	1.25	1.02%	0.21	0.30	130.00	1	27.85
1989	Other	Inactive	414.41	408.21	0.60%	1.08	0.93%	2.63	3.79	130.00	1	341.84
1990	Other	Inactive	481.66	474.64	0.61%	1.13	0.83%	3.31	3.96	130.00	1	429.78
1991	Other	Inactive	-	-	0.63%	-	0.74%	-	-	130.00	1	-
1992	Other	Inactive	332.18	327.78	0.65%	1.13	0.66%	2.40	2.15	130.00	1	312.22
1993	Other	Inactive	163.11	161.17	0.66%	1.02	0.57%	1.09	0.93	130.00	1	141.24
1994	Other	Inactive	395.55	390.86	0.68%	1.08	0.50%	2.86	1.96	130.00	1	371.48
1995	Other	Inactive	641.22	633.55	0.70%	1.13	0.44%	5.01	2.77	130.00	1	651.10
1996	Other	Inactive	152.16	151.02	0.72%	0.55	0.38%	0.59	0.58	130.00	1	77.25
1997	Other	Inactive	5.95	5.91	0.73%	0.55	0.35%	0.02	0.02	130.00	1	3.10
1998	Other	Inactive	117.09	116.21	0.75%	0.55	0.33%	0.48	0.38	130.00	1	62.53
1999	Other	Inactive	-	-	0.77%	-	0.32%	-	-	130.00	1	-
2000	Other	Inactive	116.73	115.76	0.79%	0.55	0.34%	0.50	0.39	130.00	1	65.53
2001	Other	Inactive	144.00	142.70	0.81%	0.55	0.38%	0.64	0.54	130.00	1	82.84
2002	Other	Inactive	-	-	0.83%	-	0.44%	-	-	130.00	1	-
2003	Other	Inactive	-	-	0.85%	-	0.54%	-	-	130.00	1	-
2004	Other	Inactive	56.00	54.82	0.88%	1.25	0.65%	0.60	0.36	130.00	1	78.04
2005	Other	Inactive	50.69	49.41	1.04%	1.25	0.80%	0.64	0.40	130.00	1	83.47
2006	Other	Inactive	-	-	1.22%	-	0.99%	-	-	130.00	1	-
2007	Other	Inactive	-	-	1.43%	-	1.20%	-	-	130.00	1	-
2008	Other	Inactive	-	-	1.66%	-	1.46%	-	-	130.00	1	-
2009	Other	Inactive	19.80	18.85	1.91%	1.25	1.75%	0.45	0.33	130.00	1	58.48
2010	Other	Inactive	-	-	2.19%	-	2.08%	-	-	130.00	1	-
2011	Other	Inactive	-	-	2.48%	-	2.46%	-	-	130.00	1	-
2012	Other	Inactive	-	-	2.76%	-	2.88%	-	-	130.00	1	-
2013	Other	Inactive	-	-	2.98%	-	3.35%	-	-	130.00	1	-
2014	Other	Inactive	-	-	3.10%	-	3.87%	-	-	130.00	1	-
2015	Other	Inactive	-	-	3.09%	-	4.44%	-	-	130.00	1	-
2016	Other	Inactive	-	-	2.89%	-	5.16%	-	-	130.00	1	-
2017	Other	Inactive	-	-	2.52%	-	6.74%	-	-	130.00	1	-
2018	Other	Inactive	11.88	10.14	1.97%	1.25	9.58%	0.25	0.97	130.00	1	32.43
2019	Other	Inactive	-	-	1.36%	-	12.95%	-	-	130.00	1	-
2020	Other	Inactive	-	-	0.78%	-	15.69%	-	-	130.00	1	-
2021	Other	Inactive	-	-	0.43%	-	16.69%	-	-	130.00	1	-
2022	Other	Inactive	-	-	0.08%	-	14.84%	-	-	130.00	1	-
2023	Other	Inactive	-	-	0.00%	-	9.03%	-	-	130.00	1	-

West Virginia Department of Environmental Protection Office of Sp
Actuarial Reserve Study as of June 30, 2023
Water Operations & Maintenance Cost Projection - Deterministic N

				2025									
Permit Issue Year (1)	Mine Type (2)	Mine Status (3)	Current Bonded Acres (4)	Adjusted Acres (13)	Forfeiture Rate (14)	Adjustment Factor Permit Bond Size (15)	Release Rate (16)	Forfeited Acres (17)	Released Acres (18)	Avg recl Cost per Acre (19)	Adjustment Factor Permit Status (20)	Gross Cost (21)
1965	Other	Phased Released	-	-	0.39%	-	5.34%	-	-	130.00	1	-
1966	Other	Phased Released	-	-	0.39%	-	5.34%	-	-	130.00	1	-
1967	Other	Phased Released	-	-	0.40%	-	5.45%	-	-	130.00	1	-
1968	Other	Phased Released	-	-	0.41%	-	5.56%	-	-	130.00	1	-
1969	Other	Phased Released	-	-	0.42%	-	5.68%	-	-	130.00	1	-
1970	Other	Phased Released	-	-	0.43%	-	5.79%	-	-	130.00	1	-
1971	Other	Phased Released	-	-	0.44%	-	5.91%	-	-	130.00	1	-
1972	Other	Phased Released	-	-	0.45%	-	6.03%	-	-	130.00	1	-
1973	Other	Phased Released	9.00	8.38	0.46%	1.25	6.15%	0.05	0.52	130.00	1	6.29
1974	Other	Phased Released	-	-	0.47%	-	6.28%	-	-	130.00	1	-
1975	Other	Phased Released	-	-	0.49%	-	6.41%	-	-	130.00	1	-
1976	Other	Phased Released	27.88	25.84	0.50%	1.25	6.54%	0.16	1.69	130.00	1	20.93
1977	Other	Phased Released	-	-	0.51%	-	6.67%	-	-	130.00	1	-
1978	Other	Phased Released	12.76	11.79	0.52%	1.25	6.81%	0.08	0.80	130.00	1	10.05
1979	Other	Phased Released	58.69	54.20	0.54%	1.25	6.95%	0.36	3.77	130.00	1	47.38
1980	Other	Phased Released	7.91	7.31	0.55%	1.25	6.95%	0.05	0.51	130.00	1	6.55
1981	Other	Phased Released	475.54	440.63	0.57%	1.08	6.87%	2.68	30.29	130.00	1	348.42
1982	Other	Phased Released	201.26	186.69	0.58%	1.25	6.72%	1.35	12.54	130.00	1	176.06
1983	Other	Phased Released	158.90	148.04	0.60%	1.02	6.49%	0.90	9.61	130.00	1	116.46
1984	Other	Phased Released	75.79	70.74	0.61%	1.25	6.21%	0.54	4.40	130.00	1	70.17
1985	Other	Phased Released	43.00	40.28	0.63%	1.25	5.88%	0.32	2.37	130.00	1	40.99
1986	Other	Phased Released	-	-	0.64%	-	5.51%	-	-	130.00	1	-
1987	Other	Phased Released	-	-	0.66%	-	5.12%	-	-	130.00	1	-
1988	Other	Phased Released	-	-	0.68%	-	4.70%	-	-	130.00	1	-
1989	Other	Phased Released	62.20	59.26	0.69%	1.25	4.27%	0.51	2.53	130.00	1	66.72
1990	Other	Phased Released	-	-	0.71%	-	3.84%	-	-	130.00	1	-
1991	Other	Phased Released	-	-	0.73%	-	3.42%	-	-	130.00	1	-
1992	Other	Phased Released	-	-	0.75%	-	3.02%	-	-	130.00	1	-
1993	Other	Phased Released	-	-	0.77%	-	2.64%	-	-	130.00	1	-
1994	Other	Phased Released	-	-	0.79%	-	2.30%	-	-	130.00	1	-
1995	Other	Phased Released	-	-	0.81%	-	2.01%	-	-	130.00	1	-
1996	Other	Phased Released	-	-	0.83%	-	1.77%	-	-	130.00	1	-
1997	Other	Phased Released	31.16	30.35	0.85%	1.25	1.60%	0.32	0.49	130.00	1	41.85
1998	Other	Phased Released	-	-	0.87%	-	1.50%	-	-	130.00	1	-
1999	Other	Phased Released	179.00	175.29	0.89%	0.55	1.49%	0.86	2.61	130.00	1	111.86
2000	Other	Phased Released	-	-	0.92%	-	1.57%	-	-	130.00	1	-
2001	Other	Phased Released	-	-	0.94%	-	1.75%	-	-	130.00	1	-
2002	Other	Phased Released	-	-	0.96%	-	2.04%	-	-	130.00	1	-
2003	Other	Phased Released	-	-	0.99%	-	2.46%	-	-	130.00	1	-
2004	Other	Phased Released	-	-	1.01%	-	3.01%	-	-	130.00	1	-
2005	Other	Phased Released	-	-	1.20%	-	3.70%	-	-	130.00	1	-
2006	Other	Phased Released	-	-	1.41%	-	4.54%	-	-	130.00	1	-
2007	Other	Phased Released	-	-	1.65%	-	5.54%	-	-	130.00	1	-
2008	Other	Phased Released	9.90	8.83	1.92%	1.25	6.70%	0.21	0.59	130.00	1	27.50
2009	Other	Phased Released	-	-	2.21%	-	8.05%	-	-	130.00	1	-
2010	Other	Phased Released	-	-	2.53%	-	9.58%	-	-	130.00	1	-
2011	Other	Phased Released	-	-	2.87%	-	11.32%	-	-	130.00	1	-
2012	Other	Phased Released	-	-	3.19%	-	13.26%	-	-	130.00	1	-
2013	Other	Phased Released	-	-	3.45%	-	15.41%	-	-	130.00	1	-
2014	Other	Phased Released	-	-	3.59%	-	17.79%	-	-	130.00	1	-
2015	Other	Phased Released	115.00	82.91	3.57%	1.25	20.41%	3.70	16.92	130.00	1	481.07
2016	Other	Phased Released	-	-	3.34%	-	23.72%	-	-	130.00	1	-
2017	Other	Phased Released	-	-	2.91%	-	30.99%	-	-	130.00	1	-
2018	Other	Phased Released	-	-	2.28%	-	44.09%	-	-	130.00	1	-
2019	Other	Phased Released	-	-	1.58%	-	59.57%	-	-	130.00	1	-
2020	Other	Phased Released	-	-	0.90%	-	72.17%	-	-	130.00	1	-
2021	Other	Phased Released	-	-	0.49%	-	76.77%	-	-	130.00	1	-

West Virginia Department of Environmental Protection Office of Special Reclamation
Actuarial Reserve Study as of June 30, 2023
Financial Projection

Fiscal Year Ending 6/30	Total Expenditures	Total Revenues	Beginning Balance SRF	Beginning Balance WTF	WTF to SRF Transfers	Ending Balance SRF	Ending Balance WTF
Prior						12,934,042	154,739,346
2024	39,615,668	32,603,795	12,934,042	154,739,346	22,833,468	10,000,000	150,661,516
2025	42,184,937	30,616,202	10,000,000	150,661,516	29,300,781	10,000,000	139,092,781
2026	11,046,333	28,797,313	10,000,000	139,092,781	-	11,170,253	155,673,508
2027	20,952,390	28,614,142	11,170,253	155,673,508	8,095,112	10,000,000	164,505,514
2028	28,814,113	27,550,682	10,000,000	164,505,514	17,918,775	10,000,000	163,242,083
2029	24,907,691	26,091,394	10,000,000	163,242,083	14,749,292	10,000,000	164,425,786
2030	23,987,455	25,221,103	10,000,000	164,425,786	14,338,160	10,000,000	165,659,433
2031	29,887,602	24,407,258	10,000,000	165,659,433	20,720,389	10,000,000	160,179,089
2032	22,114,964	23,358,819	10,000,000	160,179,089	13,382,890	10,000,000	161,422,944
2033	21,825,983	22,644,665	10,000,000	161,422,944	13,523,468	10,000,000	162,241,626
2034	21,555,157	21,919,509	10,000,000	162,241,626	13,675,221	10,000,000	162,605,978
2035	21,031,153	21,115,894	10,000,000	162,605,978	13,598,227	10,000,000	162,690,720
2036	20,687,990	20,314,433	10,000,000	162,690,720	13,692,724	10,000,000	162,317,162
2037	20,069,436	19,727,209	10,000,000	162,317,162	13,395,658	10,000,000	161,974,935
2038	19,761,325	19,277,469	10,000,000	161,974,935	13,341,582	10,000,000	161,491,079
2039	19,336,085	18,623,470	10,000,000	161,491,079	13,263,532	10,000,000	160,778,464
2040	18,951,808	18,175,839	10,000,000	160,778,464	13,119,669	10,000,000	160,002,494
2041	18,853,246	17,571,998	10,000,000	160,002,494	13,332,207	10,000,000	158,721,246
2042	18,490,579	17,105,464	10,000,000	158,721,246	13,200,570	10,000,000	157,336,131
2043	18,232,826	16,643,900	10,000,000	157,336,131	13,165,970	10,000,000	155,747,204


Fund Financial Projections
Per 2023 Actuarial Report
$180,000,000
$160,000,000
$140,000,000
$120,000,000
$100,000,000
$80,000,000
$60,000,000
$40,000,000
$20,000,000
$0
154,739,346
139,092,781
164,505,514
155,747,204
12,934,042
10,000,000
11,170,253
10,000,000
Prior
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Ending Balance SRF
Ending Balance WTF

Appendix E

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
A S & K, INC.	S-1011-89	8/23/1991	MONONGALIA
AMANDA NICOLE FUELS, INC.	S-1018-88	6/12/1992	PRESTON
APPALACHIAN FUELS, LLC	S-3041-88	7/25/2011	CLAY
ASSET MINING, LLC.	S-5030-95	12/6/2013	BOONE
B & S CONTRACTING, INC.	U-3055-87	4/24/1995	NICHOLAS
B & S CONTRACTING, INC.	O-3086-87	4/24/1995	NICHOLAS
BALDWIN MINING COMPANY	D-75-82	8/22/2001	GILMER
BARRENSHE COAL CO.	UO-694	8/17/1993	MCDOWELL
BARRETT FUEL CORP.	R-737	3/15/1996	RALEIGH
BELLE CONTRACTING, INC.	S-6020-87	11/14/1989	PUTNAM
BENHAM GROUP, LTD.	120-79	1/1/1990	BOONE
BOLINGREEN MINING COMPANY	S-1024-88	2/10/2000	PRESTON
BOOMERANG COAL, INC.	S-2015-06	3/8/2011	RANDOLPH
BORGMAN COAL CO.	EM-32	10/1/1991	PRESTON
BRADY CLINE COAL CO.	EM-97	8/23/1994	NICHOLAS
BUFFALO COAL COMPANY, INC.	S-2001-86	9/29/2006	GRANT
BUFFALO COAL COMPANY, INC.	S-122-80	9/29/2006	TUCKER
BUFFALO COAL COMPANY, INC.	S-52-80	9/29/2006	GRANT
BUFFALO COAL COMPANY, INC.	S-2006-86	7/10/2008	GRANT
BUFFALO COAL COMPANY, INC.	S-2011-92	7/10/2008	GRANT
BUFFALO COAL COMPANY, INC.	S-2003-03	7/10/2008	GRANT
C. C. CONLEY & SONS, INC.	S-3046-91	12/7/2000	NICHOLAS
CARSON ONE MINING, LLC	O-4-84	10/1/2010	UPSHUR
CHESTNUT RIDGE COAL CORP.	S-28-83	11/15/1993	MINERAL
CHEYENNE SALES CO., INC.	S-2009-96	9/22/2009	UPSHUR
CHEYENNE SALES COMPANY, INC.	O-11-83	7/9/2009	UPSHUR
CHICOPEE COAL COMPANY, INC.	O-6013-88	1/31/2003	CLAY
CHICOPEE COAL COMPANY, INC.	S-3006-99	3/28/2006	NICHOLAS
CHICOPEE COAL COMPANY, INC.	S-3002-98	6/23/2006	NICHOLAS
CLASSIC RES., INC.	S-55-81	5/12/1986	FAYETTE
CLASSIC RES., INC.	S-126-82	5/12/1986	FAYETTE
COAL X, INC.	UO-396	1/1/1986	LOGAN
CRANE COAL CO., INC.	S-27-83	1/3/1992	PRESTON
DAUGHERTY COAL COMPANY, INC.	17-81	4/1/1989	PRESTON
DAUGHERTY COAL COMPANY, INC.	192-77	7/1/1989	PRESTON
DAUGHERTY COAL COMPANY, INC.	65-77	7/12/1989	PRESTON
DAUGHERTY COAL COMPANY, INC.	S-1009-86	7/17/1989	PRESTON
DAUGHERTY COAL COMPANY, INC.	246-74	8/1/1989	PRESTON
DAUGHERTY COAL COMPANY, INC.	124-79	8/18/1989	PRESTON
DECONDOR COAL CO.	U-147-82	11/25/2008	PRESTON
DEEPGREEN WV, INC.	O-164-83	10/5/2015	MCDOWELL
DELTA MINING, INC.	U-2024-87	3/18/1993	UPSHUR
DLM COAL CO.	138-74	9/3/1985	UPSHUR
DLM COAL CO.	2-80	9/13/1985	UPSHUR

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
DLM COAL CO.	P-426	9/16/1985	UPSHUR
DLM COAL CO.	12-78	9/16/1985	UPSHUR
DLM COAL CO.	I-239	9/16/1985	UPSHUR
DLM COAL CO.	164-77	9/16/1985	UPSHUR
DLM COAL CO.	R-423	9/16/1985	UPSHUR
DLM COAL CO.	UO-231	9/16/1985	UPSHUR
DLM COAL CO.	187-77	9/16/1985	UPSHUR
DLM COAL CO.	1-78	9/16/1985	UPSHUR
DLM COAL CO.	135-78	9/16/1985	UPSHUR
DLM COAL CO.	58-77	9/16/1985	UPSHUR
DLM COAL CO.	H-232	10/1/1985	UPSHUR
DLM COAL CO.	71-75	10/1/1985	UPSHUR
DLM COAL CO.	23-76	10/1/1985	UPSHUR
DUSTY COALS, INC.	S-119-85	8/10/1987	NICHOLAS
E. J. & L. CO., INC.	S-3041-87	5/9/1990	RALEIGH
EASTERN ENERGY INVEST.	U-6012-88	1/28/1994	BOONE
EASTERN ENERGY INVEST.	S-6029-86	5/2/1994	KANAWHA
ED-E DEVELOPMENT CO., INC.	S-10-81	1/23/1993	PRESTON
ED-E DEVELOPMENT CO., INC.	S-1032-86	3/29/1993	PRESTON
EDWARD E. THOMPSON	S-1041-89	2/15/1994	MONONGALIA
ENERGY MARKETING CO. INC.	U-72-83	2/27/2013	BARBOUR
ENERGY MARKETING COMPANY INC	O-44-83	6/7/2010	BARBOUR
F & M COAL CO.	S-1073-86	3/13/1992	PRESTON
F & M COAL CO.	S-57-84	3/13/1992	PRESTON
F & M COAL CO.	S-1044-87	4/30/1992	PRESTON
F & M COAL CO.	S-1026-87	4/30/1992	PRESTON
F & M COAL CO.	46-79	9/24/1992	PRESTON
FALCON LAND COMPANY, INC.	P-656	4/5/2005	NICHOLAS
FARKAS COAL CO.	34-81	7/1/1988	MONONGALIA
FREEPORT MINING CORPORATION	S-1005-95	7/8/2003	PRESTON
FRUSH ENTERPRISES, INC.	S-1008-89	11/10/1992	HARRISON
GAULEY COAL SALES CO.	O-43-84	8/23/1994	NICHOLAS
GLADE RUN MINING CO.	3-72	10/3/1983	GRANT
GLADY FORK MINING, INC.	D-35-82	6/7/2004	UPSHUR
GLORY COAL CO., INC.	UO-744	12/1/1985	HARRISON
GOLDEN PRODUCTS CO.	S-1009-88	3/1/1991	MONONGALIA
GREEN MOUNTAIN ENERGY	U-4013-91	3/19/1997	WYOMING
GREENDALE COALS, INC.	S-75-83	4/1/1987	CLAY
HALLELUJAH MINING	40-81	9/24/1992	PRESTON
HARVEY ENERGY CORP.	S-11-82	9/16/1991	FAYETTE
HARVEY ENERGY CORP.	S-35-81	9/16/1991	FAYETTE
HAWKS NEST MINING CO.	O-1-81	12/7/1993	KANAWHA
HIDDEN VALLEY COAL CO.	S-60-84	8/29/1989	PRESTON
HUNT COAL, INC.	U-5071-86	6/14/1989	LOGAN

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
INTER-STATE LUMBER COMPANY, INC.	S-39-82	7/31/1995	PRESTON
INTER-STATE LUMBER COMPANY, INC.	176-77	7/31/1995	PRESTON
INTER-STATE LUMBER COMPANY, INC.	S-52-83	7/31/1995	PRESTON
INTER-STATE LUMBER COMPANY, INC.	S-112-80	7/31/1995	PRESTON
INTER-STATE LUMBER COMPANY, INC.	S-96-82	7/31/1995	PRESTON
J & N PROCESSING COMPANY, LLC	O-58-83	6/29/2001	RALEIGH
J. E. B., INC.	S-1063-86	11/1/1991	PRESTON
J. E. B., INC.	S-61-82	11/1/1991	PRESTON
J.A.L. COAL CO., INC.	S-23-82	3/12/1997	MONONGALIA
JINKS MINING COMPANY	U-3031-93	2/24/2000	NICHOLAS
JONES COAL INC	S-1030-86	7/24/1992	PRESTON
JONES COAL INC	S-9-83	11/17/1992	PRESTON
KEISTER COAL COMPANY, INC.	184-77	9/1/1983	UPSHUR
KEYSTONE COAL, INC.	U-186-83	3/17/1998	MINGO
KEYSTONE COAL, INC.	S-84-83	3/17/1998	MINGO
KODIAK LAND CO., INC.	S-3052-87	5/19/1992	FAYETTE
LAKEVIEW COAL COMPANY	S-55-84	1/23/1997	MONONGALIA
LANDMARK CORPORATION	S-34-82	1/30/2001	BOONE
LAROSA FUEL CO., INC.	S-1051-86	7/24/2009	MARION
LEVEL LAND MINING CORPORATION	S-3031-90	11/8/2006	FAYETTE
LILLYBROOK COAL CO.	S-86-85	6/1/1990	RALEIGH
LOBO CAPITOL, INC.	UO-204	8/7/1985	PRESTON
LODESTAR ENERGY, INC.	S-3083-86	1/21/2004	NICHOLAS
LODESTAR ENERGY, INC.	S-19-85	1/21/2004	NICHOLAS
LODESTAR ENERGY, INC.	S-3006-89	1/21/2004	NICHOLAS
LODESTAR ENERGY, INC.	R-5-84	5/24/2004	WYOMING
LOW ASH COAL CO.	UO-389	2/1/1985	WYOMING
M & T MINING CO.	S-3026-89	2/9/1994	NICHOLAS
MANGUS COAL, INC.	S-1036-91	3/14/2008	PRESTON
MARY RUTH CORPORATION	S-1015-88	1/17/2013	PRESTON
MAURICE JENNINGS	S-61-83	11/30/2004	PRESTON
MAURICE JENNINGS	53-78	12/10/2004	PRESTON
MERIDAN OF VIRGINIA, INC.	S-4005-89	9/14/1992	MCDOWELL
MOHIGAN MINING CO.	U-109-83	6/30/1992	MONONGALIA
MORGANTOWN ENERGY EXPORT COMPANY	U-8-83	6/14/1994	MONONGALIA
MOUNTAINEER FUELS, INC.	U-3083-87	1/30/1998	MONONGALIA
NATIONAL CONSTRUCTION COMPANY, INC.	S-2004-86	12/7/1998	BARBOUR
OMEGA MINING CO. INC.	D-79-82	10/7/1994	MONONGALIA
PIERCE COAL & CONSTRUCTION, INC.	71-80	12/1/1982	UPSHUR
PINNACLE CREEK MINING CORP.	R-721	12/7/1994	WYOMING
PRESTON ENERGY, INC.	UO-235	3/18/1994	PRESTON
PRESTON ENERGY, INC.	O-1035-87	5/5/1994	PRESTON
PRESTON ENERGY, INC.	O-43-85	5/24/1994	PRESTON
PRESTON ENERGY, INC.	O-86-82	5/25/1994	PRESTON

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
PRIMROSE COAL, INC.	7-81	3/23/2011	PRESTON
PRINCESS CINDY MINING, INC.	30-79	5/26/1987	FAYETTE
PRINCESS SUSAN COAL CO.	S-6-85	12/7/1993	KANAWHA
PUPS CREEK COALS, INC.	S-3006-94	12/6/1999	RALEIGH
RALEIGH COMMERCIAL DEVELOPMENT	149-79	1/21/1987	FAYETTE
ROBLEE COAL COMPANY	U-2026-87	3/16/2010	UPSHUR
ROBLEE COAL COMPANY	U-2001-00	4/22/2010	UPSHUR
ROCKVILLE MINING CO.	237-76	1/12/1994	PRESTON
ROCKVILLE MINING CO.	S-65-82	1/12/1994	PRESTON
ROCKVILLE MINING CO.	65-78	1/12/1994	PRESTON
ROCKVILLE MINING CO.	S-1035-86	1/12/1994	PRESTON
ROCKVILLE MINING CO.	S-91-85	1/12/1994	PRESTON
ROYAL COAL CO.	R-676	11/1/1989	FAYETTE
ROYAL SCOT MINERALS, INC.	31-72	4/28/1999	GREENBRIER
ROYAL SCOT MINERALS, INC.	D-32-81	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	S-99-83	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	56-81	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	U-40-85	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	S-90-82	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	U-3046-88	4/27/2000	GREENBRIER
ROYAL SCOT MINERALS, INC.	R-3078-86	4/27/2000	GREENBRIER
S. KELLY INDUSTRIES	51-78	6/13/1985	MONONGALIA
SAN SUE COAL CO.	19-75	1/13/1989	NICHOLAS
SHARON COAL CO.	S-1028-87	3/23/2011	PRESTON
SMITH & STOVER	EM-29	5/17/1984	RALEIGH
SOLITAIRE COAL CORPORATION, INC.	S-87-85	6/23/1989	WEBSTER
SOUTHERN EAGLE MINING CORPORATION	U-32-84	2/6/1985	RANDOLPH
STAR INDUSTRIES, INC.	R-3-81	5/27/1987	RALEIGH
STEWARTOWN COAL CORP.	67-78	6/28/1988	MONONGALIA
SUMMERSVILLE FIVE BLOCK	S-3051-88	11/1/1994	NICHOLAS
T & J COAL, INC.	P-177-85	5/29/1987	PRESTON
T & T FUELS, INC.	EM-113	10/31/1995	PRESTON
T & T FUELS, INC.	U-125-83	12/4/1995	PRESTON
THE MASTELLER COAL COMPANY	S-10-85	12/10/2003	MINERAL
THE MASTELLER COAL COMPANY	S-125-82	5/3/2004	MINERAL
TRIPLE A COALS, INC.	U-3046-87	12/17/1998	NICHOLAS
TRIPLE A COALS, INC.	S-3028-87	12/17/1998	NICHOLAS
TRIPLE A COALS, INC.	S-96-85	12/17/1998	NICHOLAS
VALLEY MINING CO., INC.	S-64-83	6/12/1992	MONONGALIA
VALLEY MINING CO., INC.	S-17-82	9/24/1992	MONONGALIA
VICKIE ENERGY, INC.	U-53-85	1/11/1995	POCAHONTAS
VIKING COAL COMPANY	UO-519	1/18/2001	PRESTON
VMS, LTD.	S-1045-87	4/4/1994	MONONGALIA
W & E LOGGING & COAL	S-20-82	5/5/1986	NICHOLAS

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
WERNER MINING CO., INC.	S-2003-86	5/20/1992	BARBOUR
WETER CO.	S-71-79	7/10/1995	PRESTON
WINCHESTER COALS, INC.	D-23-81	12/7/1993	LOGAN
WOCAP ENERGY RESOURCES, INC.	S-26-85	12/14/1993	PRESTON
X W CORP.	S-6013-87	4/20/1989	CLAY
Z & F DEVELOPMENT CO.	S-21-84	11/6/1985	MONONGALIA
ZINN COAL CO.	60-79	4/16/1991	PRESTON
ASSET MINING, LLC.	S-5030-95	12/6/2013	Boone
ASSET MINING, LLC.	S-5024-96	12/6/2013	Boone
B. L. & S. COAL COMPANY	S-1017-86	3/29/2021	Marion
BELVA COAL COMPANY	R-591	1/26/2001	Logan
BLUE RIDGE MINING, LLC	U-4007-07	9/26/2022	McDowell
BUCKEYE COAL COMPANY INC.	U-4007-90	4/24/2019	McDowell
BUFFALO COAL COMPANY, INC.	S-53-80	9/29/2006	Grant
BUFFALO COAL COMPANY, INC.	S-61-85	7/10/2008	Tucker
BUFFALO COAL COMPANY, INC.	S-2007-96	7/10/2008	Tucker
BUFFALO COAL COMPANY, INC.	S-74-76	7/10/2008	Tucker
BUFFALO COAL COMPANY, INC.	S-2003-88	8/20/2008	Tucker
CEDAR BRANCH MINING, LLC	S-3035-12	3/21/2022	Wyoming
COAL VALLEY	O-2005-10	8/28/2023	Harrison
CLUB COAL	S-1002-94	3/20/2023	Harrison
EAGLE RIDGE DEVELOPMENT GROUP, LLC	S-3035-07	6/22/2016	Nicholas
EAGLE RIDGE DEVELOPMENT GROUP, LLC	S-3016-08	6/22/2016	Fayette
ENERGY MARKETING CO. INC.	UO-885	2/27/2013	Barbour
ENERGY MARKETING CO. INC.	UO-520	2/27/2013	Barbour
ENERGY MARKETING CO. INC.	U-74-83	3/4/2013	Barbour
ERUN COAL SALES, INC.	U-4010-08	9/21/2022	McDowell
GOLD RESOURCES, LLC	S-1003-97	9/8/2014	Harrison
GOLDEN FALCON RESOURCES, INC.	U-61-84	10/4/2002	McDowell
KANAWHA DEVELOPMENT CORPORATION	O-38-84	1/17/2013	Fayette
KANAWHA DEVELOPMENT CORPORATION	O-14-81	1/17/2013	Fayette
LANDMARK CORPORATION	S-5069-88	1/30/2001	Boone
POWDER MILL PROCESSING INC.	S-5027-08	10/12/2021	Wayne
POWDER MILL PROCESSING INC.	O-5008-07	10/12/2021	Wayne
POWDER MILL PROCESSING INC.	U-5017-08	10/12/2021	Wayne
ROBLEE COAL COMPANY	O-1009-93	11/9/2009	Upshur
ROBLEE COAL COMPANY	U-1001-91	1/11/2010	Upshur
ROYAL COAL CO.	P-688	1/1/1990	Fayette
ROYAL SCOT MINERALS, INC.	S-3076-86	4/26/2000	Greenbrier
S & M ENERGY RESOURCES, LLC	U-4004-10	9/21/2022	Wyoming
SHAFER BROTHER CONSTRUCTION, INC.	S-2011-10	5/11/2015	Monongalia
SHAFER BROTHER CONSTRUCTION, INC.	S-2012-06	5/11/2015	Monongalia
SHAFER BROTHER CONSTRUCTION, INC.	S-2002-12	5/11/2015	Monongalia
UNITED COALS	U-1003-00	3/20/2023	Harrison

REVOKED PERMIT INVENTORY

CURRENT WATER & LAND RECLAMATION (7/1/77-12/31/23)

PERMIT NAME	PERMIT	DATE REVOKED	COUNTY
WILLIAMS CONSTRUCTION	S-3061-88	4/6/1998	Nicholas

TOTAL AS OF 12/31/2023 = 221

WATER
LAND

*CURRENT LIST OF ALL PERMITS BEING TREATED OR NEED RECLAMATION at the end of year 2023

c	COMPANY	PERMIT	DATE REVOKED	WATER STATUS
N	A S & K, INC.	S-1011-89	1991-08-23	TBC
N	AMANDA NICOLE FUELS, INC.	S-1018-88	1992-06-12	ACT
C	APPALACHIAN FUELS, LLC	S-3041-88	2011-07-25	P
C	ASSET MINING, LLC.	S-5030-95	2013-12-06	ACT
C	B & S CONTRACTING, INC.	U-3055-87	1995-04-24	TBRT
S	B & S CONTRACTING, INC.	O-3086-87	1995-04-24	NA
N	BALDWIN MINING COMPANY	D-75-82	2001-08-22	P
S	BARRENSHE COAL CO.	UO-694	1993-08-17	P
S	BARRETT FUEL CORP.	R-737	1996-03-15	P2
C	BELLE CONTRACTING, INC.	S-6020-87	1989-11-14	P
C	BENHAM GROUP, LTD.	120-79	1990-01-01	P
N	BOLINGREEN MINING COMPANY	S-1024-88	2000-02-10	ACT
N	BOOMERANG COAL, INC.	S-2015-06	2011-03-08	P
N	BORGMAN COAL CO.	EM-32	1991-10-01	ACT2
C	BRADY CLINE COAL CO.	EM-97	1994-08-23	TBRT
S	BRENKEE COAL CO.	UO-435	1986-11-12	NA
N	BUFFALO C1 COMPLEX	BUFFC12021	2021-03-25	UC
N	BUFFALO COAL COMPANY, INC.	S-122-80	2006-09-29	P
N	BUFFALO COAL COMPANY, INC.	S-2006-86	2008-07-10	P
N	BUFFALO COAL COMPANY, INC.	S-2011-92	2008-07-10	P
N	BUFFALO COAL COMPANY, INC.	S-2003-03	2008-07-10	NA
N	BUFFALO COAL COMPANY, INC.	S-2001-86	2006-09-29	NA
N	BUFFALO COAL COMPANY, INC.	S-52-80	2006-09-29	NA
N	BUFFALO COAL COMPANY, INC.	S-2003-88	2008-08-20	ACT2
C	C. C. CONLEY & SONS, INC.	S-3046-91	2000-12-07	P
N	CARSON ONE MINING, LLC	O-4-84	2010-10-01	ACT
N	CHESTNUT RIDGE COAL CORP.	S-28-83	1993-11-15	RT
N	CHEYENNE SALES CO., INC.	S-2009-96	2009-09-22	NA
N	CHEYENNE SALES COMPANY, INC.	O-11-83	2009-07-09	P
C	CHICOPEE COAL COMPANY, INC.	S-3002-98	2006-06-23	P
C	CHICOPEE COAL COMPANY, INC.	S-3006-99	2006-03-28	P
S	CLASSIC RES., INC.	S-55-81	1986-05-12	TBC
C	COAL X, INC.	UO-396	1986-01-01	ACT
N	CRANE COAL CO., INC.	S-27-83	1992-01-03	P
N	DAUGHERTY COAL COMPANY, INC.	246-74	1989-08-01	NA
N	DAUGHERTY COAL COMPANY, INC.	192-77	1989-07-01	ACT
N	DAUGHERTY COAL COMPANY, INC.	S-1009-86	1989-07-17	UC
N	DAUGHERTY COAL COMPANY, INC.	S-73-83	1989-07-17	NA
N	DAUGHERTY COAL COMPANY, INC.	65-77	1989-07-12	TBRT
N	DAUGHERTY COAL COMPANY, INC.	124-79	1989-08-18	NA
N	DECONDOR COAL CO.	U-147-82	2008-11-25	ACT
S	DEEPGREEN WV, INC.	O-164-83	2015-10-05	P
N	DELTA MINING, INC.	U-2024-87	1993-03-18	ACT
N	DLM COAL CO.	P-426	1985-09-16	NA
N	DLM COAL CO.	12-78	1985-09-16	ACT

c	COMPANY	PERMIT	DATE REVOKED	WATER STATUS
N	DLM COAL CO.	164-77	1985-09-16	ACT2
N	DLM COAL CO.	2-80	1985-09-13	ACT
N	DLM COAL CO.	R-423	1985-09-16	ACT
N	DLM COAL CO.	71-75	1985-10-01	NA
N	DLM COAL CO.	1-78	1985-09-16	ACT
N	DLM COAL CO.	23-76	1985-10-01	NA
N	DLM COAL CO.	135-78	1985-09-16	NA
N	DLM COAL CO.	58-77	1985-09-16	ACT2
N	DLM COAL CO.	138-74	1985-09-03	ACT2
S	DUSTY COALS, INC.	S-119-85	1987-08-10	TBRT
S	E. J. & L. CO., INC.	S-3041-87	1990-05-09	P
C	EAGLE RIDGE DEVELOPMENT GROUP, LLC	S-3016-08	2016-06-22	TBC
C	EASTERN ENERGY INVEST.	S-6029-86	1994-05-02	ACT
N	ED-E DEVELOPMENT CO., INC.	S-10-81	1993-01-23	ACT
N	ED-E DEVELOPMENT CO., INC.	S-1032-86	1993-03-29	ACT
N	EDWARD E. THOMPSON	S-1041-89	1994-02-15	ACT2
N	ENERGY MARKETING CO. INC.	U-72-83	2013-02-27	P
N	ENERGY MARKETING COMPANY INC	O-44-83	2010-06-07	NA
N	F & M COAL CO.	S-1073-86	1992-03-13	NA
N	F & M COAL CO.	S-1044-87	1992-04-30	ACT2
N	F & M COAL CO.	S-57-84	1992-03-13	RT
N	F & M COAL CO.	46-79	1992-09-24	P
N	F & M COAL CO.	S-1026-87	1992-04-30	P
S	FALCON LAND COMPANY, INC.	P-656	2005-04-05	ACT2
N	FARKAS COAL CO.	34-81	1988-07-01	ACT
N	FREEPORT MINING CORPORATION	S-1005-95	2003-07-08	ACT
N	FRUSH ENTERPRISES, INC.	S-1008-89	1992-11-10	RT
S	GAULEY COAL SALES CO.	O-43-84	1994-08-23	P
N	GLADE RUN MINING CO.	3-72	1983-10-03	P
N	GLADY FORK MINING, INC.	D-35-82	2004-06-07	ACT
N	GLORY COAL CO., INC.	UO-744	1985-12-01	P
C	GOLD STAR MINING CORP.	S-121-85	1987-07-15	NA
N	GOLDEN PRODUCTS CO.	S-1009-88	1991-03-01	P
S	GREEN MOUNTAIN ENERGY	U-4013-91	1997-03-19	P
C	GREENDALE COALS, INC.	S-75-83	1987-04-01	ACT
N	HALLELUJAH MINING	40-81	1992-09-24	ACT
S	HARVEY ENERGY CORP.	S-11-82	1991-09-16	P2
S	HARVEY ENERGY CORP.	S-35-81	1991-09-16	TBRT
C	HAWKS NEST MINING CO.	O-1-81	1993-12-07	ACT
N	HIDDEN VALLEY COAL CO.	S-60-84	1989-08-29	ACT
C	HUNT COAL, INC.	U-5071-86	1989-06-14	ACT
N	INTER-STATE LUMBER COMPANY, INC.	S-39-82	1995-07-31	TBC
N	INTER-STATE LUMBER COMPANY, INC.	176-77	1995-07-31	ACT
N	INTER-STATE LUMBER COMPANY, INC.	S-52-83	1995-07-31	ACT
N	INTER-STATE LUMBER COMPANY, INC.	S-112-80	1995-07-31	P

c	COMPANY	PERMIT	DATE REVOKED	WATER STATUS
N	INTER-STATE LUMBER COMPANY, INC.	S-96-82	1995-07-31	P
N	J. E. B., INC.	S-1063-86	1991-11-01	ACT
N	J. E. B., INC.	S-61-82	1991-11-01	ACT
N	J.A.L. COAL CO., INC.	S-23-82	1997-03-12	P
S	JINKS MINING COMPANY	U-3031-93	2000-02-24	P
N	JONES COAL INC	S-1030-86	1992-07-24	P
N	JONES COAL INC	S-9-83	1992-11-17	P
N	KEISTER COAL COMPANY, INC.	184-77	1983-09-01	ACT
C	KEYSTONE COAL, INC.	U-186-83	1998-03-17	P
C	KEYSTONE COAL, INC.	S-84-83	1998-03-17	TBC
S	KODIAK LAND CO., INC.	S-3052-87	1992-05-19	P
N	LAKEVIEW COAL COMPANY	S-55-84	1997-01-23	P
C	LANDMARK CORPORATION	S-34-82	2001-01-30	P
C	LANDMARK CORPORATION	S-5069-88	2001-01-30	P
N	LAROSA FUEL CO., INC.	S-1051-86	2009-07-24	ACT
S	LEVEL LAND MINING CORPORATION	S-3031-90	2006-11-08	P
S	LILLYBROOK COAL CO.	S-86-85	1990-06-01	RT
N	LOBO CAPITOL, INC.	UO-204	1985-08-07	NA
S	LODESTAR ENERGY, INC.	R-5-84	2004-05-24	TBRT
C	LODESTAR ENERGY, INC.	S-3083-86	2004-01-21	P
S	LODESTAR ENERGY, INC.	S-19-85	2004-01-21	P
C	LODESTAR ENERGY, INC.	S-3006-89	2004-01-21	P
S	LOW ASH COAL CO.	UO-389	1985-02-01	TBRT
C	M & T MINING CO.	S-3026-89	1994-02-09	P
N	MANGUS COAL, INC.	S-1036-91	2008-03-14	NA
N	MARTINKA WATER TREATMENT COMPLEX	MAR1-2020	2020-07-13	ACT
N	MARY RUTH CORPORATION	S-1015-88	2013-01-17	NA
N	MAURICE JENNINGS	53-78	2004-12-10	NA
N	MAURICE JENNINGS	S-61-83	2004-11-30	NA
S	MERIDAN OF VIRGINIA, INC.	S-4005-89	1992-09-14	TBC
N	MOHIGAN MINING CO.	U-109-83	1992-06-30	P
N	MORGANTOWN ENERGY EXPORT COMPANY	U-8-83	1994-06-14	P
S	MOUNTAINEER FUELS, INC.	U-3083-87	1998-01-30	P
N	NATIONAL CONSTRUCTION COMPANY, INC.	S-2004-86	1998-12-07	P
N	OMEGA MINING CO. INC.	D-79-82	1994-10-07	ACT2
N	PIERCE COAL & CONSTRUCTION, INC.	71-80	1982-12-01	ACT
S	PINNACLE CREEK MINING CORP.	R-721	1994-12-07	TBRT
N	PRESTON ENERGY, INC.	O-1035-87	1994-05-05	UC
N	PRESTON ENERGY, INC.	O-86-82	1994-05-25	ACT
N	PRESTON ENERGY, INC.	O-43-85	1994-05-24	ACT
N	PRESTON ENERGY, INC.	UO-235	1994-03-18	NA
N	PRIMROSE COAL, INC.	7-81	2011-03-23	ACT
S	PRINCESS CINDY MINING, INC.	30-79	1987-05-26	P2
C	PRINCESS SUSAN COAL CO.	S-6-85	1993-12-07	P
S	PUPS CREEK COALS, INC.	S-3006-94	1999-12-06	P

c	COMPANY	PERMIT	DATE REVOKED	WATER STATUS
S	RALEIGH COMMERCIAL DEVELOPMENT	149-79	1987-01-21	P
N	ROBLEE COAL COMPANY	U-2001-00	2010-04-22	P
N	ROBLEE COAL COMPANY	U-2026-87	2010-03-16	P
N	ROBLEE COAL COMPANY	U-1001-91	2010-01-11	P
N	ROBLEE COAL COMPANY	O-1009-93	2009-11-09	P
N	ROCKVILLE MINING CO.	237-76	1994-01-12	UC
N	ROCKVILLE MINING CO.	S-65-82	1994-01-12	ACT
N	ROCKVILLE MINING CO.	65-78	1994-01-12	ACT
N	ROCKVILLE MINING CO.	S-1035-86	1994-01-12	UC
N	ROCKVILLE MINING CO.	S-91-85	1994-01-12	NA
S	ROYAL COAL CO.	P-688	1990-01-01	TBC
S	ROYAL COAL CO.	R-676	1989-11-01	TBC
S	ROYAL SCOT MINERALS, INC.	D-32-81	2000-04-27	RT
S	ROYAL SCOT MINERALS, INC.	S-99-83	2000-04-27	TBRT
S	ROYAL SCOT MINERALS, INC.	56-81	2000-04-27	P2
S	ROYAL SCOT MINERALS, INC.	U-40-85	2000-04-27	P
S	ROYAL SCOT MINERALS, INC.	S-90-82	2000-04-27	P2
S	ROYAL SCOT MINERALS, INC.	U-3046-88	2000-04-27	TBC
S	ROYAL SCOT MINERALS, INC.	R-3078-86	2000-04-27	P
S	ROYAL SCOT MINERALS, INC.	31-72	1999-04-28	ACT2
N	S. KELLY INDUSTRIES	51-78	1985-06-13	ACT2
C	SAN SUE COAL CO.	19-75	1989-01-13	P
N	SHAFER BROTHER CONSTRUCTION, INC.	S-2002-12	2015-05-11	TBC
N	SHARON COAL CO.	S-1028-87	2011-03-23	P
S	SMITH & STOVER	EM-29	1984-05-17	TBC
S	SOLITAIRE COAL CORPORATION, INC.	S-87-85	1989-06-23	P
N	SOUTHERN EAGLE MINING CORPORATION	U-32-84	1985-02-06	P
S	STAR INDUSTRIES, INC.	R-3-81	1987-05-27	ACT
N	STEWARTOWN COAL CORP.	67-78	1988-06-28	ACT
C	SUMMERSVILLE FIVE BLOCK	S-3051-88	1994-11-01	ACT
N	T & J COAL, INC.	P-177-85	1987-05-29	ACT
N	T & T FUELS, INC.	EM-113	1995-10-31	ACT
N	T & T FUELS, INC.	U-125-83	1995-12-04	ACT
N	THE MASTELLER COAL COMPANY	S-125-82	2004-05-03	UC
N	THE MASTELLER COAL COMPANY	S-10-85	2003-12-10	P
S	TRIPLE A COALS, INC.	U-3046-87	1998-12-17	P
S	TRIPLE A COALS, INC.	S-3028-87	1998-12-17	P2
S	TRIPLE A COALS, INC.	S-96-85	1998-12-17	P
N	VALLEY MINING CO., INC.	S-64-83	1992-06-12	ACT2
N	VALLEY MINING CO., INC.	S-17-82	1992-09-24	ACT
S	VICKIE ENERGY, INC.	U-53-85	1995-01-11	TBRT
N	VIKING COAL COMPANY	UO-519	2001-01-18	NA
N	VMS, LTD.	S-1045-87	1994-04-04	RT
S	W & E LOGGING & COAL	S-20-82	1986-05-05	P
N	WERNER MINING CO., INC.	S-2003-86	1992-05-20	P

c	COMPANY	PERMIT	DATE REVOKED	WATER STATUS
N	WETER CO.	S-71-79	1995-07-10	P
N	WOCAP ENERGY RESOURCES, INC.	S-26-85	1993-12-14	ACT3
C	X W CORP.	S-6013-87	1989-04-20	P
N	Z & F DEVELOPMENT CO.	S-21-84	1985-11-06	ACT
N	ZINN COAL CO.	60-79	1991-04-16	P

Mine Drainage Treatment Prioritization 2023		
COMPANY	PERMIT	Acid Loading TPY
ASSET MINING, LLC.	S-5030-95	44.11
ROYAL COAL CO.	P-688	32.035
KEYSTONE COAL, INC.	U-186-83	21.98
INTER-STATE LUMBER COMPANY, INC.	S-39-82	17.3
SMITH & STOVER	EM-29	11.44
LODESTAR ENERGY, INC.	S-3006-89	6.21
SHAFER BROTHER CONSTRUCTION, INC.	S-2002-12	2.97
MERIDAN OF VIRGINIA, INC.	S-4005-89	0.284
CLASSIC RES., INC.	S-55-81	0.1836
EAGLE RIDGE DEVELOPMENT GROUP, LLC	S-3016-08	0.155
KEYSTONE COAL, INC.	S-84-83	0.08
ROYAL COAL CO.	R-676	0.0189