Preliminary Regulatory Economic Analysis
For

The Proposed Rule Concerning Determination of Concentration of Respirable Coal Mine Dust
(RIN-1219-AB18)
and
The Proposed Rule for Verification of Underground Coal Mine Operators' Dust Control Plans and Compliance Sampling for Respirable Dust
(RIN-1219-AB14)

Revises §70.1, §70.2, §70.100, §70.101,
§70.201 Through §70.210, §70.220,
Adds §70.211 Through §70.219,

Revises §70.370(h), §75.362(a)(2) and (g)(2), and §75.371(f) and (t),

Revises §90.2, and §90.207

U.S. Department of Labor
Mine Safety and Health
Administration
Office of Standards,
Regulations, and Variances

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I. EXECUTIVE SUMMARY

INTRODUCTION

On July 7, 2000, the Mine Safety and Health Administration (MSHA) originally published two proposed rules to control respirable dust and silica in coal mines: (1) a single shift sample (SS) rule, jointly proposed with the National Institute of Occupational Safety and Health (NIOSH), and (2) a plan verification (PV) rule.[1] At this time MSHA is reopening for comment the July 7, 2000 proposed SS rule and is revising the July 7, 2000, plan verification rule. For purpose of discussion in this document, the originally published SS and PV rules will be referred to as the July 7, 2000 proposed SS and PV rules. The reopened SS rule and the revised PV rule will be referred to as the proposed SS rule and the proposed PV rule.

This Preliminary Regulatory Economic Analysis (PREA) addresses the benefits and compliance costs associated with the proposed SS and PV rules. Generally, a PREA provides a preliminary analysis of the impacts of a single proposed rulemaking. However, this PREA analyzes both the proposed SS and PV rules because of the interrelatedness of the two rules.

Section 101 of the Federal Mine Safety and Health Act of 1977 provides the authority for these rulemakings. Executive Order 12866 requires that regulatory agencies complete a Preliminary Regulatory Economic Analysis for any rule having major economic consequences for the national economy, an individual industry, a geographic region, or a level of government. The Regulatory Flexibility Act (RFA) similarly requires regulatory agencies to consider the impact of the rule on small entities. This PREA and Regulatory Flexibility Certification have been prepared to fulfill the requirements of Executive Order 12866 and the RFA. MSHA certifies that the proposed SS and PV rules would not have a significant economic impact on a substantial number of small entities.

BACKGROUND

Currently, MSHA inspectors perform sampling in coal mines to determine the operator's compliance with the current respirable coal mine dust standard of 2 mg/m^3 as established by regulations in 30 CFR Parts 70, 71, and 90. If the average of a set of 5 MSHA inspector sample results exceeds the applicable dust standard by at least 0.1 mg/m^3, then the operator is deemed to be in noncompliance and issued a citation.

The proposed SS rule finds that the average concentration of respirable dust to which each miner in the active workings of a coal mine is exposed can be accurately measured over a

[1] 65 FR 42068 and 65 FR 42122, respectively.

single shift. Under the proposed SS rule, MSHA would no longer use the averaging method to determine noncompliance in underground and surface coal mines with respect to the MSHA sampling program. Instead, MSHA would issue a citation for excessive dust when an MSHA single-sample result is at or above the citation threshold value applicable to the standard in effect.

The proposed PV rule establishes that the effectiveness of an underground coal mine's ventilation plan would be verified. Underground coal mine operators would verify their ventilation plans by collecting full shift respirable dust samples, called "verification samples," to demonstrate the adequacy of the dust control parameters specified. The adequacy of the dust control parameters must be demonstrated on shifts during which the amount of the material produced is at or above the "verification production level" (VPL), or the tenth highest production level recorded in the most recent thirty production shifts.

The use of PAPRs and/or administrative controls would be permitted as supplementary controls if MSHA determined that all feasible engineering and environmental controls that were appropriate for the operational conditions involved were not capable of controlling respirable dust levels to or below the applicable standard. Operators would also be permitted to use PAPRs for short periods as a supplementary control if they can demonstrate the following: 1) they encounter unusual geologic conditions which occur briefly or intermittently; and 2) the dust control parameters specified in the ventilation plan are not sufficient to protect all miners.

Currently, operators sample bi-monthly in order to show compliance with the applicable dust standard. In addition, MSHA inspectors conduct their own sampling in underground and surface coal mines. If an operator is cited for excessive dust based on the results of either operator or MSHA samples, the operator must take corrective action and then conduct abatement sampling. The operator will also be assessed a civil penalty. Under the proposed PV rule, operators would no longer collect compliance or abatement samples. All periodic and abatement sampling would be performed by MSHA. Operators would be cited for overexposures based on the results of MSHA collected samples. In addition, certain operators could be required to periodically monitor the effectiveness of the dust controls verified in the approved ventilation plan by collecting at least one sample every calendar quarter. If any quarterly sample exceeds the applicable standard, the operator must take corrective action to reduce the exposure to or below the standard. Failure to take corrective action would result in a citation and an accompanying monetary penalty.

MINING SECTORS AFFECTED BY THE SS and PV RULES

The proposed SS rule would be applicable to all underground and surface coal mines. The proposed PV rule would be applicable only to underground coal mines. There were 1,911 coal mines in 2001, of which 664 were underground mines and 1,247 were surface mines.

BENEFITS

Occupational exposure to excessive levels of respirable coal mine dust imposes significant health risks to coal miners, especially for the development of coal workers' pneumoconiosis. Cumulative exposure to respirable coal mine dust is the main determinant of CWP. Through the promulgation of the SS and PV rules, on average, miners' cumulative exposure to respirable coal mine dust would be reduced since their exposure to respirable coal mine dust on each shift would be maintained within the applicable standard. Over an occupational lifetime, the reduction in cumulative exposure to respirable coal mine dust would translate into fewer cases of CWP than would otherwise occur.

To estimate the impact of these rules, MSHA used the best available data to quantify the frequency and magnitude of overexposures; the associated reduction in risk estimates of CWP (see the QRA in the preambles); and the population of affected miners. MSHA had to use data collected for compliance purposes, which may underestimate typical dust exposure levels on the majority of shifts that are not sampled. Furthermore, MSHA believes its estimates likely understate the benefits of these rules since the Agency's analyses are restricted to a sub-population of miners with an observed pattern of overexposures, not the broader population of coal miners who would benefit from these rules. Therefore, at a minimum, over an occupational lifetime (45-years) for miners who live to age 73 and who worked at MMUs with a pattern of recurrent overexposures, MSHA estimates at least 42 fewer cases of CWP than would otherwise occur without the promulgation of these rules. To the extent that the exposure data used in the quantitative risk assessment underrepresent the number and degree of overexposures experienced by underground coal miners over their occupational lifetime, the Agency has underestimated the true benefit of these rules (i.e., number of prevented cases of CWP). Even so, MSHA's quantitative estimate of benefits demonstrates, and qualitative discussions punctuate, that these rules will have a significant positive impact on the health of our nation's coal miners when promulgated.

COMPLIANCE COSTS

The costs of complying with the proposed SS rule alone, the proposed PV rule alone, and the combined SS and PV rules appear in Table IV-1 of this document and are summarized below.

Table IV-1 shows that yearly compliance costs for the proposed SS rule would be about $3.1 million. All but about $57,000 would be incurred by underground coal operators (the residual $57,000 to be borne by surface coal operators). Because annual costs include some operating, maintenance, and replacement costs that are associated with equipment purchased in one year but are not incurred until later years, actual first-year costs incurred by industry to comply with the proposed SS rule would be only $1.1 million.

Table IV-1 also shows that, with respect to only the proposed PV rule, there would be a yearly net compliance cost savings to underground coal operators of about $2.1 million.

Although implementing the proposed PV rule would cost about $4.5 million yearly, there would be offsetting yearly savings of $6.6 million. The cost savings consist of: $3.8 million due to reduced citations and the elimination of operator abatement sampling; $2.2 million resulting from the elimination of operator bi-monthly sampling requirements; $0.3 million resulting from a reduction in the number of MSHA ordered mine closures; and $0.3 million resulting from reduced Black Lung payouts by underground coal operators. These costs include net first year compliance costs of approximately $2.1 million.

Finally, Table IV-1 shows that joint promulgation of the proposed SS and PV rules would result in yearly net costs to operators of about $985,000. About $57,000 of the $985,000 would be incurred by surface coal operators; the remaining amount would be incurred by underground coal operators. Net first year compliance costs for the jointly proposed SS and PV rules are estimated to be about $3.2 million.

Under the proposed SS rule, operators would also incur civil penalty cost increases, which would be more than offset by the proposed PV rule. The penalty costs associated with both proposed rules are shown in Table IV-1(a). It should be noted that penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but are merely a transfer payment to the government from a party violating a rule. Therefore, the penalty costs shown in Table IV-1(a) are not included as part of the costs of the proposed SS and PV rules. These penalty costs are relevant, however, to the economic feasibility of these rules, which is evaluated at the end of chapter IV of this document.

EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

Executive Order 12866 requires that regulatory agencies assess both the costs and benefits of intended regulations. MSHA has fulfilled this requirement for the proposed rules and determined that these rulemakings are not economically significant, but the regulatory actions have been deemed significant under §3(f)(4) of Executive Order 12866.

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, MSHA must use the Small Business Administration's (SBA's) criterion for a small entity in determining a rule's economic impact unless, after consultation with the SBA Office of Advocacy, MSHA establishes an alternative definition for a small mine and publishes that definition in the Federal Register for notice and comment. For the mining industry, SBA defines "small" as a mine with 500 or fewer workers. MSHA traditionally has considered small mines to be those with fewer than 20 workers. To ensure that the proposed rules conforms with the RFA, MSHA has analyzed the economic impact of the proposed rules on mines with 500 or fewer workers (as well as on those with fewer than 20 workers).

MSHA has determined that the proposed SS and PV rules, both separately and in combination, would not have a significant economic impact on small mines, whether a small mine is defined as one with 500 or fewer workers or one with fewer than 20 workers.

Using the Agency's traditional definition of a small mine, which is one employing fewer than 20 workers, (1) the estimated yearly cost of the proposed SS rule on small underground and surface coal mines would be about $417,000 and $22,000 respectively; (2) under the proposed PV rule, there would be an estimated yearly net cost reduction of about $685,000 for small underground coal mines; and (3) when both proposed rules are combined, there would be an estimated yearly cost savings of about $268,000 for small underground coal mines and a cost of about $22,000 for small surface coal mines. These estimated yearly costs for small mines compare to estimated annual revenues of approximately $201.7 million for small underground coal mines and approximately $384.7 million for small surface coal mines.

Using SBA's definition of a small mine, which is one employing 500 or fewer workers, (1) the estimated yearly cost of the proposed SS rule on small underground and surface coal mines would be about $2.92 million and $57,000 respectively; (2) under the proposed PV rule, the estimated yearly cost savings would be about $2.54 million for small underground coal mines; and (3) when both proposed rules are combined, the estimated yearly costs would be about $385,000 for small underground coal mines and $57,000 for small surface coal mines. These estimated yearly costs for small coal mines, using SBA's criteria, compare to estimated annual revenues of approximately $5.64 billion for small underground coal mines and approximately $9.45 billion for small surface coal mines.

Based on its analysis, MSHA has determined that the proposed rules would not have a significant economic impact on a substantial number of small mines. MSHA has so certified these findings to the Small Business Administration. The factual basis for this certification is discussed in Chapter V of this PREA.

II. INDUSTRY PROFILE

INTRODUCTION

This industry profile provides background information on the structure and economic characteristics of the mining industry. It provides data on the number of mines, their size, and the number of employees, as well as information about selected market characteristics.

THE STRUCTURE OF THE MINING INDUSTRY

MSHA divides the mining industry into two major sectors based on commodity: (1) coal and (2) metal and nonmetal (M/NM). These sectors are further divided on the basis of type of operation (i.e., underground mines or surface mines). MSHA maintains its own data on mine type, size, and employment. MSHA also collects data on the number of contractors and contractor employees by industry sector.

MSHA categorizes mines by size based on employment. For purposes of these rules, MSHA has categorized mines into three groups. These are mines that employ: fewer than 20 workers; 20 to 500 workers; and more than 500 workers. Over the past 20 years, for rulemaking purposes, MSHA has consistently defined small mines to be those having fewer than 20 workers and large mines to be those having 20 or more workers. However, to comply with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA must use the Small Business Administration's (SBA's) criteria for small entities when determining a rule's economic impact. For the mining industry, SBA defines a small mine as one that employs 500 or fewer workers and a large mine as one that employs more than 500 workers. Thus, combining the first two MSHA mine categories noted above will encompass SBA's definition of a small mine.

No metal and nonmetal mines are affected by the proposed rules. Therefore, information is provided below only for the coal mining sector.

Table II-1 presents the number of small and large coal mines and the corresponding number of miners, excluding contractors, for the coal sector by mine type.[2] This table provides data for the three size categories previously identified: mines with fewer than 20 workers (MSHA's definition of a small mine); mines with 20 to 500 workers; and mines with more than 500 workers.

[2] In addition to mines in producing status, the total mine and miners figures in Table II-1 reflect non-producing entities that are still active, such as independent shops, preparation plants, and mines that did not have or report production in 1997. Elsewhere in the preamble, the number of reported producing mines and miners in those mines may be different due to these non-producing entities not being included.

Table II-1: Distribution of Coal Operations and Workers (Excluding Contractors) by Mine Type and Size for 2001

Mine Type	Size of Coal Mines						All Coal Mines	
	<20 Workers		20 to 500 Workers		>500 Workers			
	Mines	Workers	Mines	Workers	Mines	Workers	Mines	Workers
Underground	277	2,814	380	30,621	7	3,744	664	37,179
Surface	801	5,019	443	27,737	3	1,830	1,247	35,586
Office Workers	-	490	-	2,744	-	174	-	3,408
Total	1,078	8,323	823	62,997	10	5,748	1,911	75,173

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, Calendar Year 2001 data.

Table II-2 presents corresponding data on the number of independent contractors and contractor workers working in the coal mining sector.

Table II-2: Distribution of Contractors and Contractor Employment by Size of Operation, 2001

Contractor	Contractor Size						All Contractors	
	<20 Workers		20 to 500 Workers		>500 Workers			
	Contr.	Contr. Workers	Contr.	Contr. Workers	Contr.	Contr. Workers	Contr.	Contr. Workers
Underground	761	9,354	100	5,895	0	0	861	15,249
Surface	1,774	22,902	272	14,434	2	799	2,048	38,135
Office Workers	-	2,467	-	1,210	-	406	-	4,083
Total	3,216	34,723	372	21,539	0	1,205	2,909	57,467

Source: Surface and underground percentages from U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances based on 2001 MIS data, CT441, cycle 2001/334 were applied to U.S. Department of Labor Mine safety and Health Administration, Office of Program Evaluation and Information Resources, 2001 data.

STRUCTURE OF THE COAL MINING SECTOR

MSHA classifies the U.S. coal mining sector into two major commodity groups: bituminous and anthracite. The former is further subdivided into subbituminous and lignite. Bituminous operations represent over 93% of coal mining operations, employ over 98% of all coal miners, and account for over 99% of total coal production. About 60% of the bituminous operations are large (employ 20 or more workers), whereas about 90% of the anthracite operations are small (employ fewer than 20 workers).

MSHA data for 2001 indicate that there are about 1,911 underground and surface coal mines, of which 1,078 (about 56%) are small and 833 (about 44%) are large.[3] This categorization is based on MSHA's traditional definitions for small and large mines, respectively. On the basis of SBA's definition, 1,901 (99.5%) are small and only 10 (0.5%) are large.

Using MSHA's definition, about 75,173 miners are employed in coal mines, of which about 8,323 (11%) work at small mines and 66,850 (89%) work at large mines.[4] Using SBA's definition, about 71,320 (95%) work at small mines and 5,748 (5%) work at large mines. Average employment in small and large mines are approximately 8 and 80, respectively, using MSHA's definition, and 38 and 575, respectively, using SBA's definition.

ECONOMIC CHARACTERISTICS OF THE COAL MINING SECTOR

The U.S. coal sector produced a record 1.053 billion short tons of coal in 2000. At an average price of $16.78 per ton, the total value was estimated at $17.7 billion. Underground mines accounted for $6.0 billion, while surface mines accounted for $11.7 billion. Using MSHA's definition of a small mine, of the $17.7 billion of coal production in 2000, about $0.58 billion was produced by small underground and surface mines, and about $17.1 billion was produced by large underground and surface mines.[5]

Mines east of the Mississippi accounted for about 47% of coal production in 2000. For the period 1949 through 1996, coal production east of the Mississippi River fluctuated relatively little from a low of 395 million tons in 1954 to a high of 630 million tons in 1990. Production in 2000 was estimated at 509 million tons. During this same period, however, coal production west of the Mississippi increased each year from a low of 20 million tons in 1959 to a record high of

[3] MSHA – PEIR, Calendar Year 2001 data.

[4] MSHA – PEIR, Calendar Year 2001 data.

[5] U. S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, Table 80, p. 206, and Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

571 million tons in 1999.[6] The growth in western coal has been due, in part, to environmental concerns that led to increased demand for low-sulfur coal, which is abundant in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West. Surface mining methods for coal include drilling, blasting, and hauling and are similar for all coal commodity types. Most surface mines use front-end loaders, bulldozers, shovels, or trucks for haulage.

THE COAL MINING SECTOR: A MOVING BASELINE

MSHA's estimates in this PREA of the costs and benefits of the proposed SS and PV rules are derived relative to the baseline estimates of the number and composition (by mine size and type) of coal mines and coal miners in 2001, as presented in Table II-1 and on a 2002 snapshot of the number of working mechanized mining units (MMUs) presented in Chapter IV. MSHA's analysis assumes that, in the absence of the proposed SS and PV rules, the number and composition of coal mines and coal miners in 2001 and the number of working MMUs in 2002 will remain constant in the future.

In reality, the number and composition of coal mines and coal miners have changed over time. For instance, from 1987 to 2001 the number of coal mines declined by 61 percent, and the number of coal miners declined by 43 percent. During the same period, the percentage of underground coal declined from 41 percent to 34.7 percent and the percentage of all coal mines with fewer than 20 employees declined from 68 percent to 56 percent.

It is unclear whether the factors underlying these recent changes have played themselves out or whether further changes in the number and composition of coal mines and coal miners can be anticipated. The U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) have been conducting research and developing projections about the future of the coal mining industry.

According to DOE, the coal industry will continue to enjoy a fairly steady domestic demand for coal by electric utilities, the dominant purchaser of coal in this country. DOE projects that coal production will increase by an average of 0.9 percent a year from 1998 through 2020, in part due to rising natural gas costs and the retirement of nuclear plants.[7] DOE also projects further declines in the coal miner population of 1.5 percent a year from 1998 through 2020, despite increasing coal production, as a result of increased miner productivity and the shutdown of less productive coal mines.

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[6] U. S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, p. 201.

[7] U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 2000, pp. 87 and 138.

Unlike DOE's estimates, EPA projects about a 0.5 percent reduction in coal production and in the number of coal miners, starting in 2007, due to EPA clean air regulations of NO_x emissions, and a (further) shift from eastern to western coal and from underground coal mining to surface coal mining.[8]

MSHA notes that these DOE and EPA projections are themselves unsure and dependent on the relative low cost of oil relative to coal and on the implementation by states of the EPA regulations of NO_x emissions. MSHA further notes the complex, and sometimes offsetting, effects that these projections about the coal industry will have on the Agency's estimates of costs and benefits presented in this REA. For example, a declining baseline for the coal mine and miner population over time and a shift to western coal production will tend to reduce both the costs and the benefits of the proposed rules, but the observed increase in production per coal mine, to the extent that increased mine production is associated with higher coal mine dust levels, will tend to increase both the costs and the benefits of the proposed rules.

Given the uncertainty surrounding these projections and some of the offsetting effects on costs and benefits described above, MSHA has decided to base its estimates of regulatory costs and benefits on the baseline assumption that the number and composition of coal mines and coal miners in 2001 and the number of working MMUs in 2002 will remain approximately constant in the future.

[8]U.S. Environmental Protection Agency, Office of Air and Radiation, Regulatory Impact Analysis for the Final Section 126 Petition Rule, p. 6-25.

III. BENEFITS

This benefits analysis is in support of the proposed single sample and plan verification rules, and updates information used in the single-shift sample NPRM (65 FR 42068) and plan verification (65 FR 42122) NPRM. It has been updated to include the revised QRA;[9] the reduction in the number of active mines (and miners); and more recent information on the DOL's Black Lung Compensation Program. As a result, MSHA believes it has more comprehensively quantified the expected reduction in risk of CWP and the associated benefits (i.e., the number of prevented cases of CWP) for those miners currently subject to a pattern of recurrent overexposures to respirable coal mine dust.[10]

MSHA notes that the methodology will almost certainly lead to an underestimate of the number of MMUs with recurrent overexposures. This is due to the fact that the agency must rely on samples taken for 30 or fewer shifts each year for each MMU. MSHA estimates that each MMU averages 384 production shifts per year, so samples are taken for only about 8 percent of all shifts. An MMU exhibits a pattern of recurrent overexposure when valid samples at the MMU exceed the applicable dust standard on at least two shifts during a year. MSHA uses data for those MMUs exhibiting such a pattern to estimate miners' overexposures and the reduction in dust that would be inhaled by miners if dust levels were reduced to the exposure limit on every shift.

Due to the fact that only a small fraction of shifts are sampled, this approach will very likely underestimate the total number of shifts with excessive exposures. There is no straightforward way to determine the extent of the underestimate, but the following illustrates the likelihood of not identifying MMUs that experience excessive exposures. The table below shows the probability that an MMU will <u>not</u> exhibit a pattern of recurrent overexposures (i.e., 2 or more overexposures on 30 randomly sampled shifts out of 384 working shifts in a year) when there are actually "n" noncompliant shifts during the year. For example, if an MMU exceeds the applicable standard on 25 shifts during a year, there is a 40 percent probability that fewer than two of the 30 samples for that MMU would be taken on those 25 shifts. Therefore, there is a good chance that such an MMU would not be identified as having a pattern of recurrent exposures. It should also be noted, however, that only 6.5 percent (i.e., 25/384) of production shifts would, on average, be out of compliance at such an MMU. This is substantially below the average of 20 percent of shifts found out of compliance at MMUs MSHA has identified as exhibiting a recurrent pattern.

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[9] The revised QRA is published in full in section IV.b of the 2003 single sample reopening notice and section VI of the 2003 plan verification NPRM. The revised QRA has been expanded to include quantitative estimates of the reduction in CWP for affected roofbolters working in designated areas (RB-DA).

[10] The pattern of recurrent overexposure is defined by an MMU having any combination of two or more samples in excess of the applicable standard within a one-year period.

Table III-1. Relationship Between the Number of Noncompliant Shifts And the Probability of Not Detecting a Pattern of Recurrent Overexposures For a Single MMU

Number of Noncompliant Shifts [11]	Probability (%) of Not Being Identified [12]
5	94.9
10	82.0
15	67.0
20	52.5
25	40.0
30	29.7
35	21.6
40	15.4
45	10.9
50	7.5
55	5.1
60	3.5
65	2.3
70	1.5
75	1.0
80	0.6
85	0.4
90	0.3
95	0.2
100	0.1

Occupational exposure to excessive levels of respirable coal mine dust, which includes quartz in varying proportions, imposes significant health risks. These include the following adverse health outcomes: simple coal worker's pneumoconiosis (simple CWP), progressive massive fibrosis (PMF), silicosis, and chronic obstructive pulmonary disease (COPD) (e.g., asthma, chronic bronchitis, emphysema)(See the Health Effects, section V., of the plan verification proposed rule and section VII of the single-shift sample NPRM (65 FR 42068) for a more complete discussion). Cumulative exposure to respirable coal mine dust is the main determinant in the development of both simple CWP and PMF although other factors, such as the percentage of quartz in the respirable dust and the type of coal, also affect the risk of miners developing simple CWP and PMF (Jacobsen, et al., 1977; Hurley, et al., 1987; Kuempel, et al., 1995; Attfield and Morring, 1992; Attfield and Seixas, 1995). The true magnitude of occupationally induced simple CWP and PMF among today's coal miners is unknown, although prevalence estimates are available from various surveillance systems. The overall prevalence

[11] Number of Individual shift overexposures out of 384 shifts in a year.

[12] Probability (%) that an MMU will fail to display a pattern of recurrent overexposures, based on 30 sampled shifts, given "n" individual shift overexposures out of 384 shifts in a year.

rate of simple CWP, Categories 1, 2, and 3, (see Health Effects discussion in preamble of the proposed PV rule), and PMF combined was 2.8 percent among all miners examined in the Miners' Choice program during the 2000-2002 period. The combined prevalence rate of simple CWP and PMF for underground coal miners was 3.8 percent during the same time period. Studies from the Coal Workers X-ray Surveillance Program (CWXSP) indicate a decline in the prevalence of CWP from 11 percent in the 1970s to 2.8 percent in the sixth round of CWXSP (1992-1996)(NIOSH, Table 2-11, 1999).

The proposed single sample and plan verification rules present MSHA's strengthened plan to meet the Mine Act's requirement that a miner's exposure to respirable coal mine dust be at or below the applicable standard on each and every shift.

The QRA estimates the reduction in risk for CWP as a result of reducing respirable coal mine dust concentrations over a miners' 45-year occupational lifetime to be no more than the applicable standard on just that percentage of shifts currently exhibiting a pattern of recurrent overexposures.[13] The term "affected" is used to identify those miners who work on an MMU or RB-DA where there is a recurrent pattern of overexposure to respirable coal mine dust. There are three types of affected miners for whom reduction in risk estimates were calculated:

- C = DOs: Designated Occupation Miners.
- C ¾ NDOs: Faceworkers neither classified as a DO nor subject to a separate dust standard applicable to a Designated Area.
- C = RB-DA: Roofbolter Designated Area Miners.

Since DOs and NDOs share the same applicable dust standard, the definition of recurrent pattern of overexposure for DOs and NDOs is the same. It is determined by the pattern of recurrent overexposures observed for DOs. This pattern of recurrent overexposure is sometimes referred as the MMUs pattern of recurrent overexposures.

Applicable coal mine dust standards for RB-DAs are determined separately from the respirable coal mine dust standard shared by DOs and NDOs on the same MMU. Since RB-DAs are often exposed to higher quartz concentrations than other occupations (miners) on the same MMU, frequently, the RB-DA's applicable coal mine dust standard is more stringent (i.e., a smaller respirable coal mine dust standard) than that for other occupations working on the same MMU. A separate pattern of recurrent overexposure is defined for the RB-DAs.

[13] MMUs with a recurrent pattern of overexposure are defined as those MMUs with two or more of the DO samples exceeding the applicable standard. RB-DAs with a recurrent pattern of overexposure are defined as those with two or more RB-DA samples exceeding the applicable standard. (See the QRA section IV.b of the 2003 single sample reopening notice and section VI of the 2003 plan verification NPRM for details.)

To predict the benefits, MSHA applied its best estimate of reduction in risk of CWP for each type of affected miner (DO, NDO, and RB-DA) to estimated sub-populations of those affected miners.

The factors taken into account to estimate each of the sub-populations are:

- A recent snapshot of the number of active MMUs and RB-DAs. (MSHA, Table, May 14, 2002)
- The pattern of recurrent overexposures for affected MMUs and RB-DAs.
- The distribution of MMUs by mine size (i.e., fewer than 20 employees; 20 to 500 employees; and, more than 500 employees) and the number of production shifts (i.e. 1, 2, or 3) (MSHA, Table, July 10, 2002 for DOs and NDOs; and MSHA, Table, September 4, 2002).
- The average number of miners on a shift for each category.
- One DO on each MMU.
- Six NDOs for each MMU.
- The number of RB-DAs on a shift, varied by mine size. (See Table III-3 for specific numbers.)

Since NDOs and the DO on the same MMU share: the same pattern of recurrent overexposures (i.e., 57.0 percent) and the same distribution of MMUs by mine size and number of production shifts, the estimates of affected populations of DOs and NDOs are both included in Table III-2. The estimated sub-populations of affected miners working in DOs and NDOs are calculated as follows:

1. The distribution of active MMU entities was determined by mine size and number of production shifts (MSHA, Table, July 10, 2002).
2. The number of MMU entities that exhibited a pattern of overexposures for DOs (57.0 percent) was determined using operator and MSHA samples for respirable coal mine dust collected during the calendar year 2001 (MSHA data file: DO_2001.zip).
3. MSHA estimated the number of DOs to have been affected by recurrent overexposures by simultaneously applying the percentage of MMUs found to have patterns of recurrent overexposure (57.0 percent) to the number and type of active MMU entities by mine size (833 active MMUs; MSHA, Table May 14, 2002) and the distribution of production shifts by mine size mentioned in steps (1) and (2). MSHA estimates there would be 475 affected active MMUs.
4. The number of miners working in the DO position is proportional to the number of shifts each MMU is in production per day. The distribution of the number of affected MMU

entities by production shifts (from step 3) is applied to the estimated number of DOs per MMU entity. Typically, there is one miner for each DO for each shift.

5. Typically, six other miners operating as NDOs simultaneously work on the same MMU. Therefore, the number of affected NDOs is six times the number of affected DOs.
6. Table III-2 presents the estimated number of affected MMUs, DOs, and NDOs, by mine size and number of production shifts. The total number of affected DO and NDO miners is estimated to be 6,307.

Since RB-DAs and the combination of DOs and NDOs do not share the same pattern of recurrent overexposures, nor the distribution of MMUs by mine size, the estimates of affected populations of RB-DAs are presented in a separate table (Table III-3). The estimated sub-populations of affected miners working in the RB-DAs are calculated as follows:

1. The distribution of active RB-DA entities was recently determined by mine size and number of production shifts (MSHA, Table September 4, 2002).
2. The number of RB-DA entities that exhibit a pattern of overexposures (29.4 percent, 194/659 RB-DAs) was determined using operator and MSHA samples for respirable coal mine dust collected during the calendar year 2001 (MSHA data file: RB-DA2001.zip)
3. MSHA estimated the number of RB-DA entities affected by recurrent overexposures by simultaneously applying the percentage of RB-DAs found to have patterns of recurrent overexposure (29.4 percent) to the number and type of active RB-DA entities by mine size (449 active RB-DAs; MSHA, Table May 14, 2002) and the distribution of production shifts by mine size mentioned in steps (1) and (2). MSHA estimates there would be 132 affected active RB-DAs.
4. The number of miners working in an RB-DA entity is proportional to the number of shifts each RB-DA is in production per day. The distribution of the number of affected RB-DA entities by production shifts (determined in step 3) is applied to the estimated number of roofbolters per RB-DA entity. The typical number of miners per RB-DA varies by mine size. It is MSHA's experience that, on average, one roofbolter works within the RB-DA in coal mines with fewer than 20 employees, one and one half in coal mines with 20 to 500 employees, and two in coal mines with more than 500 employees.
5. Table III-3 presents the estimated number of affected RB-DAs and miners by mine size and number of production shifts. The total number of affected miners working within an RB-DA is estimated to be 368.

The total number of affected miners working within the specified DO, NDO, and RB-DA positions among the faceworkers in underground coal mines is estimated to be 6,675.

Table III-2. Estimated Number of Affected Mechanized Mining Units[a] (MMUs) and Affected Underground Coal Miners, by Production Shifts and Mine Size

Number of Production Shifts	Mine Size by Number of Employees									Totals			
	Less than 20 Employees			20 to 500 Employees			Greater than 500 Employees						
	MMUs n=	DOs[b] n=	NDOs[c] n=	MMUs n=	DOs[b] n=	NDOs[c] n=	MMUs n=	DOs[b] n=	NDOs[c] n=	MMUs n=	DOs[b] n=	NDOs[c] n=	Total Affected Miners on MMUs
One	98	98	588	24	24	144	0	0	0	122	122	732	854
Two	16	32	192	264	528	3,168	0	0	0	280	560	3,360	3,920
Three	0	0	0	55	165	990	18	54	324	73	219	1,314	1,533
Totals	114	130	780	343	717	4,302	18	54	324	**475**	**901**	**5,406**	**6,307**

[a] Affected MMUs in production are estimated by applying the observed percentage of MMUs' production shifts by mine size (as of July 10, 2002) to the snapshot of active MMUs as of May 14, 2002, by mine size, and multiplied by 0.570 (since fifty-seven percent of MMUs have a pattern of recurrent overexposures) (MSHA Table, July 10, 2002; MSHA Table, May 14, 2002).

Where:
[b] DO = Designated Occupational Miners = {MMUs * 1 * production shifts).

[c] NDO = Non-designated Occupational Miners = {MMUs * 6 * production shifts).

Table III-3. Estimated Number of Affected Roofbolter Designated Areas (RB-DAs) and Affected Underground Coal Miners, by Production Shifts, and Mine Size

Mine Size by Number of Employees								
Number of Affected RB-DAs [a]	**Less Than 20 Employees**		**20 to 500 Employees**		**Greater than 500 Employees**		**Totals**	
Number of Production Shifts	**RB-DAs n=**	**Miners n=**	**RB-DAs n=**	**Miners n=**	**RB-DAs n=**	**Miners n=**	**RB-DAs n=**	**Total Miners on Affected RB-DAs**
1	22	22	6	9	0	0	28	31
2	5	10	83	249	0	0	88	259
3	0	0	12	54	4	24	16	78
Totals	27	32	101	312	4	24	132	**368**
Number of Miners per RB-DA	1.0		1.5		2.0			

[a] Affected Roofbolter Designated Areas (RB-DAs) in production are estimated by applying the observed percentage of RB-DAs' production shifts by mine size (as of September 4, 2002) to the snapshot of active RB-DAs as of May 14, 2002, by mine size, and multiplied by 0.294 (since 29.4 percent of RB-DAs have a pattern of recurrent overexposures) (MSHA Table, July 10, 2002; MSHA Table, May 14, 2002). The number of miners per RB-DA varies with mine size and is applied to the estimated number of RB-DAs and the number of production shifts to determine the total number of affected faceworkers.

The total number of cases of simple CWP categories 1,2,3 or PMF that would be prevented is determined by applying the estimated number of affected miners to our best estimates of reductions in risk. The estimates of reductions in risk for the three sub-populations of affected miners (24.4 per thousand DOs, 2.3 per thousand NDOs, and 19.6 per thousand RB-DAs) are applied to the respective estimates of affected sub-populations of faceworkers (901 DOs, 5,406 NDOs, and 368 RB-DAs).[14] Table III-4 presents a summary of the estimated number of cases among groups of simple CWP and PMF that would be prevented among the affected miners working at the 57.0 percent of MMUs and the 29.4 percent of RB-DAs determined to exhibit a pattern of recurrent overexposures, by limiting their exposures to respirable coal mine dust to no more than the applicable standard on each and every shift. For all categories of simple CWP and PMF combined, MSHA estimates a minimum of 42 fewer cases among affected miners than would otherwise occur without the promulgation of the proposed single sample and plan verification rules. Thirteen of these cases would be the most severe form of coal miner's pneumoconiosis, PMF, and as such, these cases could be interpreted as prevented premature deaths due to occupational exposure to respirable coal mine dust. Since simple CWP is a progressive disease and predisposes the development of PMF, it is important that simple CWP also be prevented (Balaan, et. al., 1993).

The benefits that would accrue to coal miners exposed to respirable coal mine dust and to operators, and ultimately to society at large, are substantial and take a number of forms. These proposed rules would reduce a substantial health risk to underground coal miners, lowering the potential for illnesses and premature death and their attendant costs to miners, their employers, their families, and society.

These rules should realize a positive economic impact on the Department of Labor's (DOL's) Black Lung Program and relatedly on operators. The Black Lung Program compensates eligible miners and their survivors for benefits under the Black Lung Benefits Act. This program provides monthly payments and medical benefits (diagnostic and treatment) to miners who are determined to be totally disabled by black lung disease, including cases of PMF and simple CWP. In 1986, DOL's Employment Standards Administration reported that 12 percent of approved cases to receive benefits within the Black Lung Program were identified as cases of PMF based on chest radiographs, while 64 percent had simple CWP based on chest radiographs (ESA, 1986). For miners who stopped working in coal mines after 1969 and for whom DOL can establish that the miner worked for the same operator for at least one calendar year, and that miner had at least 125 working days in that year, that operator is financially responsible for the miner's Black Lung benefits payments. If a responsible operator cannot be identified for an eligible miner, benefits payments are made by the Black Lung Disability Trust Fund.

[14] See the Quantitative Risk Assessment (section VI. of the Plan Verification Notice of Proposed Rule Making in today's *Federal Register*) for details describing the methodology used to calculate the reduction of risk among the affected sub-populations and table VI-1 for a summary of reduction in risk estimates.

To the extent that the proposed single sample and plan verification rules reduce overexposures to respirable coal mine dust (which includes quartz), there should be fewer Black Lung Program cases. Therefore, over time, the associated financial outlay by responsible operators through either payments made into the Black Lung Disability Trust Fund, insurance premiums, or direct payments of black lung benefits should be lower than would otherwise occur. A decrease in black lung beneficiaries could help reduce the financial obligation of the Black Lung Program (See discussion in Chapter IV of this PREA for details). In fiscal year 2000, 386 claims for Black Lung Benefits were accepted as new cases; 71 percent (273 cases) are the financial responsibility of coal operators (ESA, OWCP 2000 Annual Report).[15]

MSHA's quantitative estimate of benefits demonstrates and qualitative discussions punctuate that these proposed rules will have a significant positive impact on the health of the nation's coal miners when promulgated. Yet, due to the limitations in these data, MSHA believes its benefits estimates are likely to understate the number of cases of simple CWP and PMF that would be prevented over an occupational lifetime. As discussed in the significance of risk sections of the previously published single-shift sample (65 FR 42068) and plan verification (65 FR 42122) notices and as revised in the plan verification NPRM, the data used to estimate the average overexposure which will be prevented may not represent typical environmental conditions and the associated respirable coal mine dust exposure levels in underground coal mines.

The degree to which the exposure level of respirable coal mine dust on sampling shifts may not be representative of typical exposure levels is affected by the following factors:

1. There exists a positive relationship between coal production and generation of respirable coal mine dust. While other factors may mediate the amount of airborne respirable dust, such as ventilation and water sprays, on average, higher production is positively correlated with increased quantities of airborne respirable coal mine dust (Webster, et al., 1990; Haney, et al., 1993; Green, et al., 1994);
2. Current sampling procedures permit sampling measurements to be taken at the mid-range of the distribution of the level of production — MSHA sampling measurements must be taken on shifts with production at least 60 percent of the average production during the last 30 days and the operator must have at least 50 percent of average production for the last valid set of five bimonthly samples for MSHA and operator samples, respectively;

[15] The OWCP 2001 report is not representative of current trends because of recent changes to rules governing OWCP proceedings effective January 20, 2001 (Peed, September 12, 2002). Therefore, MSHA used information from the OWCP 2000 report.

3. Miners have reported, and MSHA data have demonstrated lower levels of production on sampling shifts versus non-sampling shifts;[16]
4. On some sampling shifts, miners have reported that more engineering controls may be engaged than on other shifts, thus reducing the measured amount of respirable coal mine dust;
5. MSHA analyses have demonstrated, even when controlling for production, in mines with fewer than 125 employees, on continuous mining MMUs, respirable coal mine dust exposures were much higher during the unannounced Spot Inspection Program (SIP) sampling shifts than on shifts operators sampled — this is consistent with the effect of increasing engineering controls on shifts during which bimonthly samples are conducted compared to the level of use of engineering controls on shifts for which the operator does not expect sampling to be conducted, given the same production level;[17]
6. Across mine size, designated area samples have had greater dust levels for shifts on which unannounced compliance sampling occurred compared to operator sampling shifts — in one study they differed by at least a factor of 40 percent in large mines and 100 percent in the smallest mines;[18]
7. Existing MSHA technical information indicates that some reduction in production levels occurs during some sampling periods on longwalls (Denk, 1990);
8. Longer work hours increase miners' cumulative exposure to respirable coal mine dust, which includes quartz, beyond what was assumed in our risk estimates ("Length of Shift" survey, MSHA Office of Coal Mine Safety and Health); and
9. Because of heavy, physical work, some miners may have higher breathing rates and inhale more respirable coal mine dust, including quartz, than other miners exposed to the same airborne dust concentrations.

Although the effects cannot readily be quantified, to the extent that these rules will also reduce the cumulative exposure to respirable coal mine dust among some miners working in those MMUs currently not exhibiting a pattern of overexposures, it is reasonable to expect an incremental benefit among that sub-population of coal miners. Likewise, to the extent that the cumulative exposure to respirable coal mine dust affects other adverse health outcomes, such as silicosis and chronic obstructive pulmonary disease, it is reasonable to expect a reduction in the number and/or severity of cases for these diseases among underground coal miners.

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[16] Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993.

[17] Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993.

[18] Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993. Pp. 211-212.

Further, MSHA firmly believes that non compliance determinations based on single-sample measurements will significantly improve working conditions for miners because overexposures will be more readily identified and appropriate corrective action will be taken to reduce respirable dust levels. This is because individual sample results will not be masked due to the averaging of multiple samples. The health effects of individual shift overexposures was addressed in Consolidation Coal Company v. Secretary of Labor 8 FMSHRC 890, (1986), aff'd 824 F. 2d 1071, (D.C. Cir. 1987). In that case, the Commission found that each episode of a miner's overexposure to respirable dust significantly and substantially contributes to the health hazard of contacting chronic bronchitis or coal workers pneumoconiosis, diseases of a fairly serious nature.

Since the proposed single-sample rule would also apply to surface coal mines, it is reasonable to expect that the cumulative exposure of some surface coal miners would also be lowered, providing them with increased health protection.

As indicated elsewhere in this preamble, three significant studies have been published in the last 10 years that examined the current federal program to control respirable coal mine dust in U.S. mines. They include the MSHA Respirable Dust Task Group Report, NIOSH's Criteria Document on Occupational Exposure to Respirable Coal Mine Dust, and the Report of the Secretary of Labor's Advisory Committee on the Elimination of Pneumoconiosis Among Coal Workers. The individuals that contributed to these reports represented a wide spectrum of society including health professionals, mine operators, miners and their representatives, academia, engineers, lawyers, physicians, and health and safety specialists. While recognizing that significant progress has been made to reduce respirable dust levels in coal mines, these reports all concluded that there are existing practices in the federal program that should be changed to provide miners with improved health protection. This rulemaking was initiated to address many of the recommendations outlined in those studies.

The primary benefit of the changes recommended by the authors of the various studies, and subsequently in this proposal, is to reduce occupational lung disease among coal miners by improving the existing federal program to control exposure to respirable coal mine dust and quartz. That benefit is addressed in detail in this section. There are, however, other significant intangible benefits that will result from these program improvements.

As stated in the report of the Advisory Committee, one of MSHA's primary objectives must be to restore the confidence of individual miners that the federal program to control respirable dust will protect their health. The testimony of miners and their representatives made during the deliberations of at least two of the study groups found that coal miners believe that MSHA and operator sampling results are not representative of the mine environment to which they are exposed during normal mining operations. Consequently, many miners believe that overexposures are not being identified and corrected. This belief is attributable to several factors including, MSHA's policy of accepting as valid samples that were taken at production levels significantly below normal; the use of dust control measures during sampling that are not

incorporated in the approved ventilation plan; and the averaging of multiple-shift sample results which can mask individual overexposures and prevent action from being taken to correct the condition. All of these practices are addressed in this proposal and, therefore, should significantly improve miner confidence that MSHA and operator sampling results are typical of the operating conditions to which they are routinely exposed.

The requirement that operator sampling results be used by MSHA to make compliance determinations has been unfairly perceived by some as fundamentally flawed because operators allegedly have conflicting objectives of avoiding citations and protecting miner health. As recommended by the Advisory Committee, this proposal eliminates the requirement that operator samples be used for compliance purposes. Operators will only be subject to enforcement action on their sample results if they fail to take action to correct any overexposure. Since only MSHA samples taken during unannounced inspections will be used to make compliance determinations, any real or perceived opportunity by mine operators to inappropriately impact sampling results will be eliminated or significantly reduced.

All of the studies recognized that significant improvements in preventing overexposure can occur if real-time continuous monitors were available. Such devices would allow exposure levels to be monitored during the production shift and action could be taken during the shift to prevent overexposure as miners approached the upper limit. This is in contrast to the current system that requires samples to be sent to a laboratory for analysis and, as a result, only allows for overexposures to be recorded rather than prevented. This proposal recognizes that the potential for the introduction of such continuous monitoring devices is likely in the near future. As a result, provisions are included for the use of such instruments in lieu of the current approved sampling devices. Accordingly, this proposal encourages the development and introduction of this new technology into coal mines to benefit miner health.

MSHA's belief that the projected 42 prevented cases of simple CWP and PMF over a 45-year working life likely understates the true number of cases of simple CWP and PMF is further supported by the fact that during the past few years, the Black Lung Benefits Program has been approving roughly 400 claims each year. Most of these claims come from individuals whose occupational exposure to respirable coal mine dust occurred under the current respirable coal mine dust program, including the 2.0 mg/m^3 standard, which began in 1972 (ESA, September 19, 2002). The observation that roughly 400 claims have been approved each year, for the past several years, supports MSHA's belief that the true lifetime occupational health benefits of the proposed rules are higher than MSHA has been able to quantify. Even assuming that over time, the number of new claims would decline in future years simply due to the continuing decline in the number of coal miners, MSHA expects that assuring future exposures are maintained below the applicable standard would reduce the number of new cases of CWP than would otherwise occur.

In addition to the cases of simple CWP and PMF that would be prevented among the miners working on affected MMUs and RB-DAs, other health benefits would also be realized

because the cumulative exposure to respirable coal mine dust would be limited to no more than the applicable standard on each and every shift. Health benefits associated with a reduction in exposures to resprirable coal mine dust would include a decrease in incidence of silicosis, asthma, chronic bronchitis, and emphysema.

All cases of simple CWP and PMF, which MSHA expects to be prevented through promulgation of the single sample and plan verification rules and attributable to eliminating individual shift overexposures, are not expected to materialize immediately after overexposures have been substantially reduced or eliminated. Because these diseases typically arise after many years of cumulative exposure, allowing for a period of latency, and the pre-existing occupational exposure histories of members of the current coal mining workforce, the beneficial effects of reducing exposures are expected to become evident only after a sufficient time has passed so that the reduction in cumulative exposure could have its effect. The total realized benefits would not be fully evident until after the youngest of today's underground coal miners retire. If the size of this workforce substantially changed in the future and the projected pattern of prevented overexposures remained the same, the number of cases of prevented simple CWP and PMF would need to be adjusted to account for the change.

Table III-4. Over a Working Lifetime Among Affected Miners, Estimated Number of Cases of CWP[a] and PMF[b] Prevented Due to the Implementation of Single Sample and Plan Verification

Type of Miner	Affected Miners, n=	Simple CWP categories 1, 2, 3 or PMF		Simple CWP categories 2 or 3 or PMF		PMF	
		Reduction in Risk[c]	Prevented Cases, n=	Reduction in Risk	Prevented Cases, n=	Reduction in risk	Prevented Cases, n=
Affected Designated Occupational Miners[d]	901	24.4/1000	22.0	15.5/1000	14.0	7.6/1000	6.8
Affected Non-Designated Occupational Miners[e]	5,406	2.3 /1000	12.4	1.5/1000	8.1	0.7/1000	3.8
Affected Roofbolters in Designated Areas[f]	368	19.6/1000	7.2	12.1/1000	4.5	6.0/1000	2.2
TOTAL [g]	6,675	na	42	na	27	na	13

[a] Simple CWP: simple coal workers' pneumoconiosis.

[b] PMF: progressive massive fibrosis.

[c] Reduction in Risk per 1,000 affected miners, over a 45-year working lifetime, at age 73.

[d] Affected Designated Occupation (DO) Miners: includes all miners who work at the 57.0 percent of the Mechanized Mining Units under consideration and who are exposed to dust concentrations similar to the DO, over a 45-year occupational lifetime.

[e] Affected Non-Designated Occupation (NDO) Miners: includes all underground faceworkers under consideration who are not classified as the DO or a "designated area roofbolter.

[f] Affected Roofbolter Designated Area (DA) Miners: includes all miners working as roofbolters in the 29.4 percent of roofbolter designated areas exhibiting a pattern of recurrent overexposures.

[g] The total miners affected (6,675) is a sub-population of the estimated number of underground coal miners (12,317) working at the mine face.

IV. COMPLIANCE COSTS

INTRODUCTION

In this chapter, MSHA derives its estimate of the costs (and cost savings, if applicable) of complying with MSHA's proposed single sample (SS) and plan verification (PV) rules. The proposed SS and PV rules are interrelated and are intended to be promulgated simultaneously. However, for purposes of exposition, the compliance costs are presented in two parts. Part 1 estimates the cost of complying with the proposed SS rule, assuming that the proposed PV rule has not yet been implemented. Then, Part 2 estimates the cost of complying with the proposed PV rule, assuming the proposed SS rule has already been implemented.

The Proposed Single Sample Rule

As a result of the proposed SS rule, MSHA inspectors would make noncompliance determinations based on a single sample result rather than the current method, which is to average a set of up to 5 single sample results, taken on different shifts. An analysis conducted by MSHA's Office of Coal Mine Safety and Health indicates that this change would increase the number of citations issued by MSHA to coal operators. The consequence of issuing more citations is that coal operators would be required to take corrective actions and conduct abatement sampling to demonstrate compliance. These abatement actions would cause both underground and surface coal operators to incur compliance costs.

The Proposed Plan Verification Rule

The proposed PV rule would require underground coal operators to verify the effectiveness of the dust control parameters of the mine ventilation plan. Verified dust control plans would result in fewer overexposures and thus fewer citations. Issuing fewer citations would reduce the costs of corrective actions arising from such overexposures. Under the proposed PV rule, the operator bi-monthly and abatement sampling requirements would be eliminated for MMUs, DAs, and part 90 miners. Operators could be required to conduct quarterly sampling for an MMU. Operators would continue to collect 5 samples that are currently required to determine if a part 90 miner has been assigned to a position that meets the 1.0 mg/m^3 respirable coal mine dust standard.

Operators would incur costs to implement the proposed PV rule. However, the proposed PV rule would also provide operator cost savings from the reduced number of citations and the change in operator sampling requirements.

SUMMARY COSTS FOR SS RULE AND PV RULE

Table IV-1 presents first year compliance costs, annualized compliance costs, annual compliance costs, and total yearly compliance costs (which are the sum of annualized costs and annual costs) for coal operators resulting from the proposed SS rule and the proposed PV rule. Table IV-1 shows the breakdown of total compliance costs for those mine size categories that employ: (1) fewer than 20 workers; (2) 20 to 500 workers; and (3) more than 500 workers. All MSHA cost estimates are presented in 2001 dollars. The total costs reported in Table IV-1, and in all other tables in this chapter, are the Agency's best estimates of the projected costs based on our experience and available information. In some cases, however, our estimates may appear to deviate slightly from the sum or product of their component factors due to the fact that the component factors have been rounded in the tables for purposes of readability.

Table IV-1 shows that yearly compliance costs for the proposed SS rule would be about $3.1 million. All but about $57,000 would be incurred by underground coal operators (the residual $57,000 to be borne by surface coal operators). Because annual costs include some operating, maintenance, and replacement costs that are associated with equipment purchased in one year but are not incurred until later years, actual first-year costs incurred by industry to comply with the proposed SS rule would be only $1.1 million.

Table IV-1 also shows that, with respect to only the proposed PV rule, there would be a yearly net compliance cost savings to underground coal operators of about $2.1 million. Although implementing the proposed PV rule would cost about $4.5 million yearly, there would be offsetting yearly savings of $6.6 million. The cost savings consist of: $3.8 million due to reduced citations and the elimination of operator abatement sampling; $2.2 million resulting from the elimination of operator bi-monthly sampling requirements; $0.3 million resulting from a reduction in the number of MSHA ordered mine closures; and $0.3 million resulting from reduced Black Lung payouts by underground coal operators. These costs include net first year compliance costs of approximately $2.1 million.

Finally, Table IV-1 shows that joint promulgation of the proposed SS and PV rules would result in yearly net costs to operators of about $985,000. About $57,000 of the $985,000 would be incurred by surface coal operators; the remaining amount would be incurred by underground coal operators. Net first year compliance costs for the jointly proposed SS and PV are estimated to be about $3.2 million.

Under the proposed SS rule, operators would also incur civil penalty cost increases, which would be more than offset by the proposed PV rule. The penalty costs associated with both proposed rules are shown in Table IV-1(a). It should be noted that penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but are merely a transfer payment to the government from a party violating a rule. Therefore, the penalty costs shown in Table IV-1(a) are not included as part of the costs of the

proposed SS and PV rules. These penalty costs are relevant, however, to the economic feasibility of these rules, which is evaluated at the end of this chapter.

Table IV-1:
Summary of the Costs to Coal Operators of the Proposed SS and PV Rules
(Excluding Operator Penalty Costs and Savings and Miners Costs to Observe Sampling) *

Proposed SS and PV Rules	<20 Emp.				20 to 500 Emp.				>500 Emp.				Total			
	Adj. First Year Costs [a]	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs [a]	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs [a]	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs [a]	Annual-ized Costs	Annual Costs	Yearly Costs
UNDERGROUND COAL OPERATORS																
SS Rule Alone [b]	$0	$0	$417,248	$417,248	$0	$0	$2,502,826	$2,502,826	$0	$0	$107,554	$107,554	$0	$0	$3,027,627	$3,027,627
PV Rule Costs [c]	$1,066,888	$85,808	$345,109	$430,916	$6,990,666	$539,678	$2,950,719	$3,490,398	$812,605	$61,781	$566,695	$628,476	$8,870,159	$687,266	$3,862,523	$4,549,789
PV Rule Cost Savings																
Reduced Citations & Elimination of Abatement Sampling [d]	-$122,214	-$8,555	$510,717	$502,162	-$749,817	-$52,487	$3,208,690	$3,156,203	-$18,726	-$1,311	$119,130	$117,819	-$890,757	-$62,353	$3,838,537	$3,776,184
Elim. Operator Bi-monthly Sampling [e]	$0	$0	$563,074	$563,074	$0	$0	$1,618,267	$1,618,267	$0	$0	$54,620	$54,620	$0	$0	$2,235,961	$2,235,961
Reduced Mine Closures [f]	$0	$0	$0	$0	$0	$0	$298,400	$298,400	$0	$0	$0	$0	$0	$0	$298,400	$298,400
Black Lung Savings [g]	$0	$0	$50,801	$50,801	$0	$0	$267,552	$267,552	$0	$0	$20,320	$20,320	$0	$0	$338,674	$338,674
Total PV Rule Savings	-$122,214	-$8,555	$1,124,592	$1,116,037	-$749,817	-$52,487	$5,392,909	$5,340,422	-$18,726	-$1,311	$194,070	$192,760	-$890,757	-$62,353	$6,711,572	$6,649,219
PV Rule Net Costs	$1,189,102	$94,363	-$779,484	-$685,121	$7,740,483	$592,166	-$2,442,190	-$1,850,024	$831,331	$63,091	$372,625	$435,716	$9,760,916	$749,619	-$2,849,049	-$2,099,429
SS & PV Rules Combined	$1,189,102	$94,363	-$362,236	-$267,873	$7,740,483	$592,166	$60,636	$652,801	$831,331	$63,091	$480,178	$543,270	$9,760,916	$749,619	$178,578	$928,198
SURFACE COAL OPERATORS																
SS Rule Alone [b]	$0	$0	$21,844	$21,844	$0	$0	$35,141	$35,141	$0	$0	$0	$0	$0	$0	$56,985	$56,985
UNDERGROUND AND SURFACE COAL OPERATORS																
SS & PV Rules Combined	$1,189,102	$94,363	-$340,392	-$246,029	$7,740,483	$592,166	$95,777	$687,943	$831,331	$63,091	$480,178	$543,270	$9,760,916	$749,619	$235,564	$985,183

*** See Table IV-1(a) for miners costs to observe sampling. See Table IV-1(b) for operators penalty costs and savings.**

[a] For the SS and PV rules, adjusted first year costs and annual costs include some operating, maintenance, and replacement (OM&R) costs that are associated with first year equipment costs, but are not incurred until later years. When these later year OM&R costs are subtracted out, the adjusted first year costs born by underground coal mines to comply with the PV rule would be $3,203,937 rather than $9,760,916. The adjusted first year costs to comply with the PV rule by mine size, after subtracting out the later-year OM&R costs, would be $422,550 for mines with fewer than 20 workers, $2,520,546 for mines with 20 to 500 workers, and $260,841 for mines with more than 500 workers. Total first year costs, including annual costs, borne by underground coal mines to comply with the PV rule would be $2,116,552 ($179,595 for mines with fewer than 20 workers, $1,624,001 for mines with 20 to 500 workers, and $672,146 for mines with more than 500 workers). Total first year costs, including annual costs, borne by underground coal mines to comply with the combined SS and PV rules would be $3,169,637 ($31,340 for mines with fewer than 20 workers, $2,493,706 for mines with 20 to 500 workers, and $707,271 for mines with more than 500 workers). Total first year costs, including annual costs, borne by all coal mines, both underground and surface, to comply with the combined SS and PV rules would be $3,206,695 ($15,074 for mines with fewer than 20 workers, $2,514,498 for mines with 20 to 500 workers, and $707,271 for mines with more than 500 workers).

[b] Source: Table IV-19.

[c] Source: Table IV-81.

[d] Source: Table IV-90.

[e] Source: Table IV-101.

[f] Source: Table IV-102.

[g] Source: Table IV-103.

Table IV-1(a):
Summary of Operators' Penalty Costs and Penalty Cost Savings Under the Proposed SS and PV Rules

Proposed PV Rule	<20 Emp.				20 to 500 Emp.				>500 Emp.				Total			
	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs
UNDERGROUND COAL OPERATORS																
Penalty Increases																
SS Rule [a]	$0	$0	$60,560	$60,560	$0	$0	$1,631,361	$1,631,361	$0	$0	$40,472	$40,472	$0	$0	$1,732,393	$1,732,393
Penalty Reductions																
PV Rule [b]	-$22,100	-$1,547	$157,552	$156,005	-$589,750	-$41,283	$2,839,490	$2,798,208	-$8,970	-$628	$66,935	$66,307	-$620,820	-$43,457	$3,063,977	$3,020,520
Net Penalty Costs	$22,100	$1,547	-$96,992	-$95,445	$589,750	$41,283	-$1,208,129	-$1,166,847	$8,970	$628	-$26,463	-$25,835	$620,820	$43,457	-$1,331,584	-$1,288,127

[a] Source: Table IV-20.

[b] Source: Table IV-95.

METHODOLOGY

In determining the effects of the proposed rules, MSHA estimated the following, as appropriate: (1) one-time or intermittent costs; (2) annualized costs (one-time or intermittent costs amortized over a specific number of years); and (3) annual costs. One-time costs are those that are incurred only once and do not recur. Intermittent costs are those that occur from time to time, but not annually. Examples of one-time or intermittent costs are capital expenditures, such as the cost of purchasing compliance equipment, and the cost of developing and writing a ventilation plan. For the purposes of this analysis, one-time costs have been annualized using a (real) annual discount rate of 7%, as required by the U. S. Office of Management and Budget (OMB), over an infinite (or, at least, indefinite) period using the formula:

$$a = (i * (1 + i)^n) /((1 + i)^n - 1),$$

where "a" is the annualization factor, "i" is the annual discount rate, and "n" is the economic life of the investment. As "n" becomes large, the value of "a" approaches the discount rate. Therefore, for one-time costs with an infinite life, MSHA has applied an annualization factor equal to the annual discount rate of 7% (that is, the annualized cost is equal to 7% of the one-time cost). Unless otherwise specified, all first year costs in this PREA were annualized using a 7 percent annualization factor.

Converting one-time costs to annualized costs allows them to be added to annual costs in order to compute the yearly costs of a rule.[19] Annual costs are costs that normally recur annually.[20] Two examples of annual costs are (annual) refresher training costs and recordkeeping costs.

With the exception of the certified dust technician wage rate, the labor costs used in this analysis for coal miners are based upon their 2001 wage rates. The certified dust technician's wage rate was supplied by MSHA's Office of Coal Mine Safety and Health. The wage rates used in this analysis are:

- C $28.07 per hour for a coal miner;
- C $19.95 per hour for a certified dust technician to take samples;

[19] Note that many one-time costs, such as labor and testing costs or small capital costs, would not normally be financed by mine operators. Nevertheless, we have annualized all one-time costs so as to be able to provide a simple, single estimate of the cost of an MSHA regulation: its yearly cost. The yearly cost of a regulation converts all of the costs of a regulation, whenever and however frequently they occur, into an equivalent steam of uniform yearly costs.

[20] Note that, for the proposed PV rule, some annual costs are incurred beginning with the second year after the rule takes effect. MSHA transformed these annual costs beginning in Year Two to normal annual costs (beginning in year one) by reducing first year only costs by an equal amount.

- $54.92 per hour for a supervisor; and
- $19.58 for a clerical worker.[21]

These wage rates include benefits (which include social security, unemployment insurance, and workers' compensation), but do not reflect shift differentials or overtime pay. For convenience, MSHA will refer to miner "compensation" in this PREA as "wages," where that term is understood to include benefits.

We note that many of the assumptions and estimates of cost components in this chapter rely exclusively on MSHA's own knowledge and experience.

SCOPE

The proposed SS rule would affect all underground and surface coal mines. In 2001, there were 1,911 coal mines, of which 664 were underground mines and 1,247 were surface mines.[22] Total employment (excluding office workers) at coal mines, in 2001, was 71,765, of which underground mines accounted for 37,179 workers, and surface mines accounted for 34,586.[23] The proposed PV rule would affect all underground coal mines but no surface mines.

For the purpose of this PREA, the Agency has disaggregated its analysis of each cost provision for three different mine size categories, which are composed of those mines employing: (1) fewer than 20 workers; (2) 20 to 500 workers; and (3) more than 500 workers. This was done to realize two goals. First, under the Regulatory Flexibility Act (RFA), MSHA is required to use the Small Business Administration (SBA) definition of a small entity. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer workers (13 CFR 121.201). Almost all of the coal mines affected by this rulemaking fall into this category. Second, however, the Agency has traditionally examined the impact of its proposed rules on what the mining community refers to as "small mines" – those with fewer than 20 workers. These small mines differ from larger mines not only in the number of employees, but also, among other things, in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Thus, combining the two smallest mine size categories (fewer than 20 workers, and 20 to 500 workers) allows MSHA's analysis to comply

[21] Wages, other than certified dust technician, derived from U.S. Coal Mine Salaries, Wages, and Benefits 2001 Survey Results, Western Mine Engineering, 2001.

[22] These estimates include mines that are in non-producing status for some part of the year. However, in the analysis of the costs of the proposed PV rule in Chapter IV, only MMU in producing status during a certain period were used to determine compliance costs.

[23] U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2001 data.

with its RFA requirements, while the smallest category (fewer than 20 workers) allows MSHA to continue the Agency's traditional look at "small mines."

PART 1 - ESTIMATED COMPLIANCE COSTS FOR CITATIONS BASED ON MSHA INSPECTOR SS RESULT

In this part 1, we estimate compliance costs for the proposed SS rule alone, under the assumption that the re-proposed PV rule has not (yet) been promulgated.[24] As demonstrated in Part 2 of this chapter, many of the SS costs are offset by cost savings from the proposed PV rule. As we previously indicated, the proposed SS rule would cause an increase in the number of citations issued to underground and surface coal operators which are based on MSHA inspector sample results. Nearly all of the additional SS citations would be issued at underground coal mines. These additional SS citations occur as a result of MSHA inspectors citing noncompliance based on a single-sample result rather than on the average of multiple-shift sample results. Operator costs associated with the additional SS citations are related to:

- taking corrective action(s) in order to get back into compliance;
- performing abatement sampling;
- completing dust data cards for abatement sampling;
- sending abatement samples to MSHA for processing;
- posting abatement sampling results;
- revising the ventilation plan (applicable to underground mines) or preparing a dust control plan (applicable to surface mines);
- Sending a ventilation or dust control plan to MSHA and posting it;
- preparing a dust plan (applicable to part 90 citations);
- giving the dust plan to the part 90 miner (applicable to part 90 citations); and
- paying civil penalties associated with the citations.

In underground coal mines there are a number of different sampling categories carried out by MSHA. These are: designated and non-designated occupations or areas associated with a mechanized mining unit (referred to herein as an MMU); roof bolter designated areas (RB-DA); intake designated areas (I-DA); outby designated areas (O-DA); designated work positions (DWP) and non-designated work positions (NDWP); and part 90 miners (P90). The DWP and NDWP samples are collected at surface coal mines as well as at surface areas of underground mines. A part 90 miner is one who has shown evidence of the development of coal workers'

[24] In Part 2 of this chapter, the costs to operators of the PV rule are estimated under the assumption that the SS rule is already in effect.

pneumoconiosis (CWP) and has opted to work in a low-dust area of the mine with no reduction in pay. Currently, with the exception of NDWPs, all of the above categories are required to be sampled by mine operators on a bimonthly basis.

Table IV-2, which was developed by MSHA's Office of Coal Mine Safety and Health, shows the annual number of additional SS citations, by mine size, that MSHA estimates it would issue as a result of making noncompliance determinations based on a single-sample result, rather than on the average of samples taken on multiple shifts. The Federal Mine Safety and Health Review Commission's decision in MSHA v. Excel, 23 FMSHRC 600 (June 2001), concluded that the 1972 Finding by the Secretaries of Interior and Health, Education, and Welfare not only precluded MSHA from issuing a citation for a violation of the respirable dust standard based on a single sample from a single shift, but also precluded MSHA from issuing a citation based on multiple samples collected over a single shift. Although MSHA has appealed this decision, this PREA estimates the additional citations arising from a SS standard relative to the number of citations arising from averaging multiple-shift samples.[25]

As Table IV-2 shows, underground coal mine operators in all three mine size categories would experience an increase in the number of citations.[26] However, for surface operators, only two mine size categories (mines employing fewer than 20 workers and mines employing 20 to 500 workers) would experience an increase in the number of citations.

[25] The Secretary's appeal of the Commission's decision is now pending before the D.C. Circuit Court of Appeals (D.C. Cir. No. 01-1335). Briefs were filed on June 10, 2002 and oral argument is scheduled for October 7, 2002. However, MSHA ceased issuing citations based on multiple samples taken over a single shift pending a resolution of the appeal. The promulgation of the SS rule would address the 1972 finding and the consequences of the June 2001 Court decision for both the MSHA and operator sampling programs.

[26] The number of additional citations is the difference between the number of citations based on single-sample determinations versus the baseline number of citations under MSHA's current sampling program. The estimate of the number of additional citations in this PREA that MSHA anticipates issuing under the SS rule reflects a substantial increase over those estimated in the PREA that supported the July 7, 2000 proposal. This is because the baseline period for the revised costs estimates (August through December 2001) is part of the time period after which MSHA ceased issuing citations based upon multiple samples collected over a single shift in response to the Excel decision. As a result, the number of citations issued during the revised baseline period is lower than the number of citations for the baseline period used in the PREA that supported the July 7, 2000 cost estimate. The estimate of the number of additional citations MSHA expects to issue under the proposed SS rule rose from 561 in the PREA supporting the July 7, 2000 rule to 909 estimated in this PREA.

Table IV-2: Additional SS Citations Issued Annually as a Result of MSHA Inspectors Using the Single-Sample Method Rather than the Averaging Method for Non-compliance Determinations

Additional SS Citations [a]								
Size Category	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	95	20	2	1	3	0	0	121
20 to 500 emp.	518	135	28	19	7	1	0	708
>500 emp.	26	0	6	0	0	0	0	32
Ug. Total	639	155	36	20	10	1	0	861
Surface Coal Mines [b]								
<20 emp.	0	0	0	0	0	13	8	21
20 to 500 emp.	0	0	0	0	0	15	12	27
>500 emp.	0	0	0	0	0	0	0	0
Surf. Total	0	0	0	0	0	28	20	48

[a] Citation numbers were supplied by MSHA's Office of Coal Mine Safety and Health and are contained in the docket for this proposed SS rule.

[b] Samples at surface coal mines are taken only at DWP and NDWP areas.

Table IV-3 shows the number of additional SS citations reported in Table IV-2, by mine size category, that MSHA estimates would be issued at non-longwall and longwall MMUs in underground and in surface coal mines. The longwall mining process and the associated methods to control its environment are so different from other MMUs that it is evaluated separately. As of May 2002, there were 50 active longwalls nationwide. Each of these longwalls is located in an underground coal mine employing 20 or more workers. In 2000, longwalls made up six percent of total MMUs in underground coal mines and accounted for 50.6 percent of total underground coal production.[27] Based on MSHA's experience, the Agency assumes that approximately 88 percent of the additional SS citations at underground coal mines would occur at non-longwall MMUs and the remaining 12 percent would occur at longwall MMUs.

[27] U.S. Department of Labor, Energy Information Agency, Coal Industry Annual 2000, January 2002, pp. 10 and 11.

Table IV-3: Additional SS Citations Issued Annually at Non-longwall and Longwall MMUs by Mine Size Category Due to SS Rule [a]

Size Category	No. of Additional SS Citations
Underground Coal Mines	
<20 emp. no lgwl	121
20 to 500 emp. no lgwl	623
20 to 500 emp. lgwl	85
Sub-total	708
>500 emp. no lgwl	28
>500 emp. lgwl	4
Sub-total	32
Total Underground	861
Surface Coal Mines	
<20 emp.	21
≥20 emp. ≤500	27
>500 emp.	0
Total Surface	48

[a] There are no longwall MMUs in any underground coal mine employing fewer than 20 workers or in any surface coal mine.

Annual Costs of Corrective Actions Related to Additional SS Citations

Once a coal operator is cited for noncompliance, the operator is required to take corrective action, involving adjustments to existing dust controls and/or the mining process to abate the violation.

Various corrective actions may be taken to abate an SS citation. Some of these actions are more costly than others. For example, repeating a maintenance task that is already routinely performed by the operator (e.g., cleaning a water spray or adjusting a line curtain) would involve minimum costs. In general, corrective actions to abate an SS citation would involve the following types of engineering controls: isolation, ventilation, dust suppression using water, and dust collection. The costs of the corrective action will vary depending on the type or combination of controls to be employed. There is no single solution that would fit every situation.

Table IV-4 shows examples of the types of corrective actions, including estimates of their cost range, that could be implemented by a non-longwall operator to abate an SS citation.

Table IV-4: Types of Corrective Actions and Associated Costs That Could be Used to Abate an SS Citation at Non-longwall MMUs

Type of Corrective Action	Cost Range
Ventilation	
Increasing air flow	**$50 to $1,000**
Installing or repositioning curtains	
Dust Suppression Using Water	
Adjusting the number and/or location of water sprays	
Adjusting type, flow rate, or pressure of a water spray	
Applying wetting agents	**$50 to $2,500**
Wetting down roadways	
Dust Collection	
Changing scrubber screen size on a machine	**$300 to $900**
Repairing or replacing dust collector on roof bolter	

Table IV-5 shows examples of the types of corrective actions, including estimates of their cost range, that could be implemented by a longwall operator to abate an SS citation.

Table IV-5: Types of Corrective Actions and Associated Costs That Could be Used to Abate an SS Citation at Longwall MMUs

Type of Corrective Action	Cost Range
Isolation	
Installing a remote control device on a machine	**$500 to**
Enclosing the headgate gate crusher on a longwall panel	**$1,000**
Ventilation	
Changing air flow	
Adjusting belt air	
Installing or repositioning curtains	
Installing gob curtains	**$50 to**
Installing a shearer-clearer system	**$3,000**
Dust Suppression Using Water	
Adjusting the number and/or location of water sprays	
Adjusting type, flow rate, or pressure of a water spray	
Applying wetting agents	
Wetting down roadways	**$50 to**
Washing down shields	**$3,000**

MSHA assumes that, in many cases, the required corrective actions taken before the first set of abatement samples are collected would not cause coal operators to incur compliance costs that are unique to the SS citation. Often, the overexposure which is the basis for the citation can be corrected by carrying out tasks such as keeping water sprays and scrubbers clean and making sure line curtains are hung correctly. These actions are performed routinely by operators as part of a good maintenance program. At other times, an overexposure may be due to the miner not following proper work practices by positioning himself/herself incorrectly during the shift (e.g., a continuous miner operator with a remote control that stands on the wrong side of the line curtain). In this case, the corrective action would be to follow proper work procedures on every shift. This type of corrective action would not involve any additional compliance costs for the operator. MSHA estimates that corrective actions involving compliance costs unique to the proposed SS rule would be required to abate 40 percent of additional annual SS citations at underground non-longwall and surface mines, and 60 percent of additional annual SS citations at underground longwall mines, before the first set of abatement samples is taken.

For operators taking corrective actions unique to the proposed SS rule, MSHA assumes the following corrective actions would be undertaken by underground coal operators to abate MMU and RB-DA citations for non-longwall MMUs:

- 50 percent would involve ventilation, costing between $50 and $1,000 to install (for an average of $525);
- 75 percent would involve dust suppression using water, costing between $50 and $2,500 to install (for an average of $1,275); and
- 50 percent would involve dust collection, costing between $300 and $900 to install (for an average of $600).

MSHA assumes that more than one type of corrective action would often be required to abate a citation. This explains why the sum of the above percentages exceeds 100 percent. On average, the cost to abate an MMU or RB-DA citation in a non-longwall mine is estimated to be: $1,519 = (0.5 x $525) + (0.75 x $1,275) + (0.5 x $600). The cost of these corrective actions per MMU or RB-DA citation does not appear to vary by mine size.

These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original cost of the corrective actions taken.[28]

For operators taking corrective action unique to the proposed SS rule to abate MMU and RB-DA citations for longwall MMUs, MSHA assumes the following corrective actions would be undertaken by underground coal operators:[29]

- 20 percent would involve isolation, costing between $500 and $1,000 to install (for an average of $750);
- 25 percent would involve ventilation, costing between $50 to $3,000 to install (for an average of $1,525); and

[28] The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C / 0.07)^{i}$$

where C is the cost of the corrective action, 0.07 is the discount rate, and i represents the n^{th} year after the rule goes into effect. This equation for S can be simplified to equal (0.25 x C/0.07).

[29] There is no RB-DA when an MMU is using the longwall method for mining.

- 100 percent would involve dust suppression using water, costing between $50 and $3,000 to install (for an average of $1,525).

Therefore, on average, the cost to abate an MMU citation in a longwall mine is estimated to be $2,056 = (0.2 x $750) + (0.25 x $1,525) + (1 x $1,525). These corrective actions would also generate an associated stream of OM&R costs, where these costs each year would be equal to approximately 25 percent of original corrective action costs.

About 91 percent of the additional SS citations estimated to be issued annually in underground coal mines affect MMU and RB-DA entities. The remaining 9 percent of citations affect I-DA, O-DA, P-90, and DWP entities.[30] On average, MSHA estimates that corrective action costs to abate these remaining 9 percent of citations would be about $200 per citation for operators employing fewer than 20 workers and about $400 for operators employing 20 or more workers. These costs would apply whether or not the citation occurred in a non-longwall mine or longwall mine. These corrective actions would also generate an associated stream of OM&R costs, where these costs each year would be equal to approximately 25 percent of the original corrective action costs.

For surface coal mines, MSHA estimates that the cost to abate an additional SS citation is about $200 for operators employing fewer than 20 workers and about $400 for operators employing 20 or more workers. Again, these corrective actions would generate an associated stream of OM&R costs, where the costs each year would be approximately 25 percent of the original corrective action costs.

The types of corrective actions noted above, as well as their frequency and cost were provided by MSHA's technical staff in the Office of Coal Mine Safety and Health. The estimates are based on the technical staff's: (1) knowledge of the engineering controls that are currently available and used in underground and surface coal mines; (2) experience with the effectiveness of those controls in the underground and surface coal mining environment; (3) experience with the procedures currently used to abate non-compliance conditions; and (4) experience with compliance and non-compliance rates in the underground and surface coal mining sector.

The types of corrective actions expected to be taken do not differ by mine size. Most citations are associated with a mechanized mining unit (MMU) or a roof bolter. Across mine size, given the same method of coal extraction (e.g., longwalls) and type of mining entity, each MMU must comply with approximately the same ventilation requirements. In addition, each comparable MMU, irrespective of mine size, uses the same type and amount of equipment, and the mining personnel operating the equipment perform similar functions. The types of corrective

[30] There are no additional SS citations estimated for NDWPs at surface areas of underground mines.

actions for intake DA, outby DA, part 90, DWP, and NDWP citations also do not differ by mine size.

In the Preliminary Regulatory Economic Analysis (PREA) supporting the July 7, 2000 SS and PV proposed rules, MSHA requested comments on the anticipated types of corrective actions, their cost ranges, and the applicability of such corrective actions to verify ventilation plans under the PV rule. One commenter stated that MSHA had underestimated the potential cost of new engineering controls that would be required for operators to achieve and remain in compliance. In this regard, the commenter noted that the PREA associated with the July 7, 2000 SS and PV proposed rules did not show costs for the installation of new ventilation structures, shafts, or larger fan installations for underground coal mines.

The corrective actions described above do not involve expenditures of the magnitude noted by the commenter, (e.g., $5 to $10 million, or $5,000 a foot to install a new shaft lined with concrete). Such expenditures are not anticipated under the proposed SS rule because MSHA's existing regulation (§75.370(a)(1)) requires underground coal operators to have a mine ventilation plan suitable to the current mining conditions in order to control methane and respirable dust. Specifically, §75.370(a)(1) states:

> "The operator shall develop and follow a ventilation plan approved by the district manager. The plan shall be designed to control methane and respirable dust and shall be suitable to the conditions and mining system at the mine."

To meet this requirement the underground coal operator must already have the correct number and types of air shafts, ventilation structures, and fans to control methane and respirable dust at current production levels. If not, then the operator is not complying with existing §75.370(a)(1).[31]

Based on the preceding information, Table IV-6 shows, by size category, underground and surface coal operators' annual costs of taking corrective actions due to additional SS citations prior to taking the first set of abatement samples.

[31] With regard to the compliance cost analysis for the PV rule (which appears later in this document), corrective actions associated with verifying a ventilation plan also would not involve "significant" expenditures as asserted by the commenter. The reason for this is the same: the operator is currently required to follow existing §75.370(a)(1). This point will be restated later when the compliance costs for the proposed Plan Verification rule are derived.

Table IV-6: Total Annual Cost of Corrective Actions
Prior to Taking the First Set of Abatement Samples
Due to Additional SS Citations Issued Annually

Size Category	No. of Additional MMU & RB-DA SS Citations[a]	No. of All Other Additional SS Citations [a]	MMU & RB-DA Corrective Action Costs per (SS Citation)[b]	Other Citation Corrective Action Costs per (SS Citation)[c]	Total Annual Costs[d]
Underground Mines					
<20 emp.	46.0	2.4	$6,944	$914	$321,618
20 to 500 emp. no lgwl	229.9	19.4	$6,944	$1,829	$1,631,521
20 to 500 emp. lgwl	47.0	4.0	$9,399	$1,829	$449,138
Sub-total	276.9	23.3			$2,080,659
>500 emp. no lgwl	9.2	2.1	$6,944	$1,829	$67,413
>500 emp. lgwl	1.9	0.4	$9,399	$1,829	$18,385
Sub-total	11.0	2.5			$85,798
Total Ug. Annual Costs					$2,488,075
Surface Mines					
<20 emp.	0	8.4	$0	$914	$7,680
20 to 500 emp.	0	10.8	$0	$1,829	$19,749
>500 emp.	0	0	$0	$0	$0
Total Surf. Annual Costs					$27,429
Total Annual Costs					$2,515,504

[a] Assumes that 40 percent of non-longwall citations and 60 percent of longwall citations from Table IV-3 would involve corrective actions unique to the proposed SS rule. The share of additional MMU & RB-DA citations relative to all other additional citations (I-DA, O-DA, and P-90 citations) was derived from Table IV-2.

[b] For non-longwall MMUs & RB-DAs $6,944 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $1,519 = (0.50 x $525) + (0.75 x $1,275) + (0.50 x $600); and (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs. For longwall MMUs & RB-DAs $9,399 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective of action $2,056 = (0.20 x $750) + (0.25 x $1,525) + (1 x $1,525); and (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

[c] For other citations in ug. non-longwall mines and surface mines employing fewer than 20 workers: $914 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $200; and (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs. For other citations in ug. longwall mines and surface mines employing 20 to 500 workers: $1,829 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $400; (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

[d] Total annual costs = (no. of additional MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of all other additional citations x other citation corrective action costs).

MSHA assumes that, after the first set of abatement samples is taken, a small number of the cited MMUs would continue to be out of compliance. For these MMUs, a second set of abatement samples will need to be taken provided the abatement period has been extended by the MSHA inspector.[32] Before this occurs, MSHA assumes that all of the affected MMUs will take additional corrective actions involving compliance costs. MSHA also assumes that all MMUs would be able to achieve compliance after a second set of abatement samples is taken.

MSHA estimates that the following additional SS citations would require the operator to take corrective actions before taking a second set of abatement samples:

- 7 citations for underground mines employing fewer than 20 workers (3 MMU citations and 4 RB-DA citations);
- 23 citations for underground mines employing 20 to 500 workers (20 MMU citations, of which 17 affect non-longwalls and 3 affect longwalls, and 3 RB-DA citations affecting non-longwalls); and
- 2 MMU citations for non-longwalls in underground mines employing more than 500 workers.

The above figures were provided by MSHA's Office of Coal Mine Safety and Health and are shown in Table IV-7. For those citations at surface mines, MSHA does not anticipate any would require the collection of a second set of abatement samples. Thus, all additional SS citations associated with surface mines are assumed to achieve compliance after the first set of abatement samples are taken.

[32] The operator does not receive a second citation if the results of the first set of abatement samples continue to show noncompliance.

Table IV-7: Additional SS Citations Issued Annually by Mine Size Category at Non-longwall and Longwall MMUs Requiring Corrective Actions Prior to Taking a Second Set of Abatment Samples

Size Category	No. of Additional SS Citations Requiring a Second Set of Abatement Samples [a]
Underground Coal Mines	
<20 emp. no lgwl	7
20 to 500 emp. no lgwl	20
20 to 500 emp. lgwl	3
Sub-total	23
>500 emp. no lgwl	2
>500 emp. lgwl	0
Sub-total	2
Total Underground	32
Surface Coal Mines	
<20 emp.	0
≥20 emp. ≤500	0
>500 emp.	0
Total Surface	0

[a] These additional SS citations, which are a subset of those that appear in Table IV-3, require a second set of abatement samples, and therefore should not be added to the additional SS citations in Table IV-3.

Table IV-8 uses the figures from Table IV-7 to calculate operators' annual costs for corrective actions taken prior to collecting a second set of abatement samples. The cost of corrective actions per citation used in Table IV-8 are the same as those used in Table IV-6.

Table IV-8: Total Annual Cost of Corrective Actions Prior to Taking a Second Set of Abatement Samples Due to Additional SS Citations Issued Annually

Size Category	No. of Additional MMU & RB-DA SS Citations[a]	No. of All Other Additional SS Citations[a]	MMU & RB-DA Corrective Action Costs per (SS Citation)[b]	Other Citation Corrective Action Costs per (SS Citation)[c]	Total Annual Costs[d]
Underground Mines					
<20 emp.	7	0	$6,944	$914	$48,608
20 to 500 emp. no lgwl	20	0	$6,944	$1,829	$138,880
20 to 500 emp. lgwl	3	0	$9,399	$1,829	$28,197
Sub-total	23	0			$167,077
>500 emp. no lgwl	2	0	$6,944	$1,829	$13,888
>500 emp. lgwl	0	0	$9,399	$1,829	$0
Sub-total	2	0			$13,888
Total Ug. Annual Costs					$229,573
Surface Mines					
<20 emp.	0	0	$0	$914	$0
20 to 500 emp.	0	0	$0	$1,829	$0
>500 emp.	0	0	$0	$0	$0
Total Surf. Annual Costs	0	0			$0
Total Annual Costs					$229,573

[a] Citations from Table IV-7.

[b] For non-longwall MMUs & RB-DAs $6,944 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $1,519 = (0.50 x $525) + (0.75 x $1,275) + (0.50 x $600); and (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs. For longwall MMUs & RB-DAs $9,399 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective of action $2,056 = (0.20 x $750) + (0.25 x $1,525) + (1 x $1,525); and (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

[c] For other citations in ug. non-longwall mines and surface mines employing fewer than 20 workers: $914 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $200; (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs. For other citations in ug. longwall mines and surface mines employing 20 to 500 workers: $1,829 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action of $400; where (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

[d] Total annual costs = (no. of additional MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of all other additional citations x other citation corrective action costs).

Existing §§ 75.370(a)(1), 71.300(a) and 90.300(a)
Costs to Write or Revise Plan

As a result of the additional SS citations, some mine operators would be required to either revise their existing ventilation plans or develop or revise dust control plans. Section 75.370 requires underground coal mine operators to have an approved mine ventilation plan prior to beginning production. Surface coal mine operators are generally allowed to operate without a dust control plan. However, §71.300 requires surface mine operators to have a respirable dust control plan applicable to the work position after abating a citation for excessive dust. Section 90.300 requires a coal operator who receives a part 90 citation to develop a respirable dust control plan for the part 90 miner after abating the citation.

For underground mines, MSHA estimates that the following additional SS citations would require that mine plans be revised or developed:

- 24 additional SS citations for operators employing fewer than 20 workers;
- 158 additional SS citations for operators employing 20 to 500 workers (of which 139 citations relate to non-longwall MMUs and the remaining 19 citations relate to longwall MMUs); and
- 6 additional SS citations for operators employing more than 500 workers (of which 5 citations relate to non-longwall MMUs and the remaining 1 citation relates to a longwall MMU.

For surface mines, MSHA estimates that the following additional SS citations would require that a dust control plan be developed or revised:

- 21 additional SS citations for operators employing fewer than 20 workers; and
- 27 additional citations for operators employing 20 to 500 workers.

On average, MSHA estimates that revisions to a mine ventilation plan or to develop or revise a dust control plan would take a mine supervisor approximately 0.5 hours for operators employing fewer than 20 workers and 1 hour for operators employing 20 or more workers.

Table IV-9 shows operators' annual costs associated with either revising a mine ventilation plan or developing a dust control plan in response to additional SS citations.

Table IV-9: 75.370(a)(1), 71.300(a), and 90.300(a)
Costs to Revise or Develop Dust Control Plans
Due to Additional SS Citations

Size Category	No. of Additional SS Citations	Time Needed for Plans (in hrs.)	Superv. Wage Rate per hr.	Total Annual Costs
Underground Coal Mines				
<20 emp.	24	0.5	$54.92	$659
20 to 500 emp. no lgwl	139	1	$54.92	$7,634
20 to 500 emp. lgwl	19	1	$54.92	$1,043
Sub-total	158			$8,677
>500 emp. no lgwl	5	1	$54.92	$275
>500 emp. lgwl	1	1	$54.92	$55
Sub-total	6			$330
Total Ug. Annual Costs				$9,666
Surface Coal Mines				
<20 emp.	21	0.5	$54.92	$577
20 to 500 emp.	27	1	$54.92	$1,483
>500 emp.	0	1	$54.92	$0
Total Surf. Annual Costs				$2,060
Total Annual Costs				$11,725

Existing §§ 75.370(a)(2), 71.300(a), & 90.300(a) Costs to Send Mine Plans to MSHA

A copy of a new plan or revisions to an existing plan would need to be sent to MSHA. The Agency estimates that a clerical worker would take 12 minutes (0.2 hours) to copy and send in plan changes to MSHA. On average, the estimated length of plan changes is 2 pages for operators employing fewer than 20 workers and 3 pages for operators employing 20 or more workers. Photocopying costs are estimated to be $0.15 per page. Postage costs are estimated to be $0.60. The number of additional SS citations that would require revising a mine ventilation plan or revising or developing a dust control plan comes from Table IV-9.

Table IV-10 show operators' annual costs to send MSHA plan changes that are associated with the additional SS citations.

Table IV-10: 75.370(a)(2), 71.300(a), and 90.300(a)
Costs to Copy and Send Revised or Developed Dust Control Plans to MSHA Due to Additional SS Citations

Size category	No. of Additional SS Citations [a]	Costs to Copy and Send [b]	Total Annual Costs
Underground Coal Mines			
<20 emp.	24	$4.82	$116
20 to 500 emp. no lgwl	139	$4.97	$690
20 to 500 emp. lgwl	19	$4.97	$94
Sub-total	158		$785
>500 emp. no lgwl	5	$4.97	$25
>500 emp. lgwl	1	$4.97	$5
Sub-total	6		$30
Total Ug. Annual Costs			$930
Surface Coal Mines			
<20 emp.	21	$4.82	$101
20 to 500 emp.	27	$4.97	$134
>500 emp.	0	$4.97	$0
Total Surf. Annual Costs			$235
Total Annual Costs			$1,165

[a] Citations from Table IV-9.

[b] $4.82 = ($19.58 hourly wage rate x 0.2 hours) +(2 pgs. x $0.15 per pg.) + $0.60 postage.

$4.97 = ($19.58 hourly wage rate x 0.2 hours) +(3 pgs. x $0.15 per pg.) + $0.60 postage.

Existing §§ 75.370(a)(3)(iii), 71.301(d), and 90.301(d) Cost to Post Plan Revisions or Provide part 90 Miner with Copy of Plan

Section 75.370(a)(3)(iii) requires that underground coal mine operators post a copy of any changes to the mine ventilation plan on the mine bulletin board. Section 71.301(d) requires that surface mine operators post a copy of the current dust control plan on the mine bulletin board. Section 90.301(d) requires that the operator provide a copy of the current dust control plan to the affected part 90 miner.

MSHA estimates that a clerical worker would require 0.25 hours (15 minutes) to copy and post either revisions to a mine ventilation plan, revisions to a dust control plan, or a new dust plan. MSHA assumes that it would take the same amount of time to copy and post the material as it would to copy and provide the material to an affected part 90 miner. On average, the estimated length of plan changes are 2 pages for operators employing fewer than 20 workers and 3 pages for operators employing 20 or more workers. Photocopying costs are estimated to be $0.15 per page. The number of additional SS citations associated with posting or providing plans or plan revisions come from Table IV-9.

Table IV-11 shows operators' annual costs to post or provide plans or plan revisions that are associated with the additional SS citations.

Table IV-11: 75.370(a)(3)(iii), 71.301(d), and 90.301(d)
Costs to Copy and Post Mine Plans or Provide Plan to Part 90 Miner
Due to Additional SS Citations

Size Category	No. of Additional SS Citations [a]	Costs to Copy and Post or Provide Plan [b]	Total Annual Costs
Underground Coal Mines			
<20 emp.	24	$5.20	$125
20 to 500 emp. no lgwl	139	$5.35	$743
20 to 500 emp. lgwl	19	$5.35	$102
Sub-total	158		$845
>500 emp. no lgwl	5	$5.35	$27
>500 emp. lgwl	1	$5.35	$5
Sub-total	6		$32
Total Ug. Annual Costs			$1,001
Surface Coal Mines			
<20 emp.	21	$5.20	$109
20 to 500 emp.	27	$5.35	$144
>500 emp.	0	$5.35	$0
Total Surf. Annual Costs			$253
Total Annual Costs			$1,255

[a] Citations from Table IV-9.

[b] $5.20 = ($19.58 hourly wage rate x 0.25 hours) +(2 pgs. x $0.15 per pg.).

$5.35 = ($19.58 hourly wage rate x 0.25 hours) +(3 pgs. x $0.15 per pg.).

Existing §§ 70.201(d), 71.201(d), & 90.201(d) Annual Costs of Abatement Sampling Related to Additional SS Citations

Under the proposed SS rule (but absent the PV rule), when cited for excessive dust, the operator would be required to take corrective action and conduct abatement sampling to demonstrate compliance. The operator samples each production shift until 5 valid samples are taken. For each abatement sample taken, the operator provides information about the sample on a dust data card and sends it, along with the sample, to MSHA's laboratory for analysis. MSHA

analyzes the operator abatement samples to determine whether the corrective action taken achieves compliance with the applicable dust standard. If the average dust concentration is at or below the applicable standard, MSHA considers the violation to be abated and then terminates the citation. (Henceforth, for purposes of discussion, this process of averaging 5 valid sample results will be referred to as the averaging method). Although MSHA inspectors would cite on the basis of a single-sample result, under current regulations, the operators' abatement sample results would continue to be averaged to determine if compliance with the applicable dust standard has been demonstrated.

The abatement period may be extended if the first set of five abatement sample results indicate continued noncompliance. During this extension, the operator would take additional corrective actions. After taking additional corrective actions, the operator would collect a second set of five abatement samples to demonstrate compliance with the applicable dust standard. This process of abating a dust violation continues until the average of the 5 valid operator abatement sample results show compliance with the applicable dust standard. If the MSHA inspector has reason to believe that an operator has not made a good-faith effort to correct the problem, the inspector may choose not to extend the time for abatement and issue a closure order instead. A closure order would cause the operator to immediately cease all mining activities in the affected area. For the purpose of determining the operator abatement sampling costs related to the additional SS citations, this analysis assumes that all operators are able to achieve compliance with applicable dust standards based on either the results of the first or second set of five abatement samples. This is consistent with MSHA experience under the Interim Single-Sample Enforcement Policy (ISSEP).

It should be noted that abatement sampling costs are not the same for all coal operators. Some operators perform their own sampling using their own sampling equipment. Others may use rented sampling equipment to perform their sampling. Finally, some operators contract out their sampling to independent contractors who perform such service using their (the contractors') own equipment. In this latter case, the contractors are responsible for completing the dust data card for each sample and sending the samples along with the dust data cards to MSHA for analysis.

Based on the input from individual MSHA field offices, the distribution on a percentage basis of the three sampling scenarios discussed above is as follows:

- For underground coal operators that have no longwall operations and employ fewer than 20 workers: 63 percent perform their own sampling using their own equipment; 33 percent perform their own sampling using rented equipment; and 4 percent use independent contractors to perform their sampling.

- For underground coal operators that have no longwall operations and employ 20 to 500 workers: 66 percent perform their own sampling using their own

equipment; 30 percent perform their own sampling using rented equipment; and 4 percent use independent contractors to perform their sampling.

- For underground coal operators that have longwall operations and employ 20 to 500 workers, and for operators that employ more than 500 workers (whether or not such operators have a longwall operation), 100 percent of them perform their own sampling using their own equipment.

- For surface coal operators that employ fewer than 20 workers: 45 percent perform their own sampling using their own equipment; 8 percent perform their own sampling using rented equipment; and 47 percent use independent contractors to perform their sampling.

- For surface coal operators that employ 20 to 500 workers: 56 percent perform their own sampling using their own equipment; 16 percent perform their own sampling using rented equipment; and 28 percent use independent contractors to perform their sampling.

- For surface coal mine operations that employ more than 500 workers perform their own sampling using their own equipment.

As discussed above, Table IV-12 shows the estimated percentage of underground and surface coal operators that either sample using their own equipment; sample using rented equipment; or contract out their sampling responsibilities.

Table IV-12
Percentage of Underground and Surface Coal Mines that Sample Under Different Scenarios by Mine Size and Sampling Type

Sampling Scenarios[a]	Underground and Surface Coal Mines								
	<20 Employees			20 to 500 Employees			>500 Employees		
	Underg. Mines		Surface	Underg. Mines		Surface	Underg. Mines		Surface
	L/Wall	NL/Wall	Mines	L/Wall	NL/Wall	Mines	L/Wall	NL/Wall	Mines
Mines with own equip.	0	63%	45%	100%	66%	56%	100%	100%	100%
Mines renting equip.	0	33%	8%	0	30%	16%	0	0	0
Mines contracting	0	4%	47%	0	4%	28%	0	0	0
Total	0	100%	100%	100%	100%	100%	100%	100%	100%

[a] Percentage of mines under each sampling scenario provided by MSHA's Coal Mine Health Division.

On average, MSHA estimates that it takes approximately 1 hour to prepare the sampling device and perform the required checks during sampling. This time period includes 0.8333 hours (50 minutes) of a certified dust technician's time to prepare, disassemble, and clean the sampling unit after completion of sampling. In addition, it takes a mine supervisor 0.1666 hours (10 minutes) to make the required operational checks of the sampling device during the shift. These estimates were provided by MSHA's Office of Coal Mine Safety and Health.

The cost to collect one sample is dependent on who performs the sampling and with whose equipment. If a mine operator samples using its own sampling equipment, then sampling costs include the cost of the certified dust technician's and mine supervisor's sampling time, plus $13.81 for a cassette filter. Using the time estimates listed above, the cost to take one sample by an operator conducting sampling, with the operator's own equipment, would be $39.59 [(0.8333 x $19.95) + (0.1666 x $54.92) + $13.81].

If operators perform sampling using rented equipment, then sampling costs consist of the costs associated with the certified dust technician's and mine supervisor's time to perform sampling, plus the costs to rent sampling equipment. The rental charge is estimated to be $78.75 per sample (which includes the cost of the filter). Therefore, the total cost to take one sample by operators conducting sampling using rented equipment is estimated to be $104.53 [(0.8333 x $19.95) + (0.1666 x $54.92) + $78.75].

If operators use an independent contractor to perform sampling, then the cost of sampling is estimated to be $210 per sample. This includes the amount charged by the contractor to

conduct the sampling (using their own equipment); complete the dust data cards; and mail samples and dust data cards to MSHA's laboratory for analysis.

The PREA developed for the July 7, 2000 proposed rules contained a technician hourly wage rate of $19, a $75 operator fee for renting sampling equipment, and a $200 per sample charge when sampling is conducted by a contractor. These cost figures, which were provided by MSHA's Office of Coal Mine Safety and Health, were subsequently increased by 5 percent for this PREA.[33]

As noted earlier, for each additional SS citation, the operator must collect a first set of five valid abatement samples. If the average of the first set of five valid abatement samples indicates continuing noncompliance, the operator must take additional corrective action followed by the collection and submission of a second set of five valid abatement samples. Summing the additional SS citations requiring a first set of five valid abatement samples (shown in Tables IV-3) and the additional SS citations requiring a second set of five valid abatement samples (shown in Table IV-7) provides the total number of additional SS citations requiring the collection of abatement samples.

Table IV-13 shows operators' annual abatement sampling costs due to the additional SS citations.

[33] U.S. Department if Labor, Bureau of Labor Statistics, Consumer Price Index (All Urban Consumers). ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt

Table IV-13: Existing 70.201(d), 71.201(d) & 90.201(d)
Total Annual Abatement Sampling Costs Due to Additional SS Citations

Size category	No. of Additional SS Citations[a]	No. of Samples per SS Citation	Cost Per Sample[b]	Total Annual Costs
Underground Coal Mines				
<20 emp.	128	5	$67.84	$43,414
20 to 500 emp. no lgwl	643	5	$65.89	$211,839
20 to 500 emp. lgwl	88	5	$39.59	$17,411
Sub-total	731			$229,250
>500 emp. no lgwl	30	5	$39.59	$5,970
>500 emp. lgwl	4	5	$39.59	$760
Sub-total	34			$6,730
Total Ug. Annual Costs				$279,395
Surface Coal Mines				
<20 emp.	21	5	$124.88	$13,112
20 to 500 emp.	27	5	$97.69	$13,189
>500 emp.	0	5	$39.59	$0
Total Surf. Annual Costs				$26,301

[a] These citations reflect the additional SS citations shown in Table IV-3 and the subset of additional SS citations shown in Table IV-7. The citations from Tables IV-3 and IV-7 are added together to arrive at the operator's costs to conduct abatement sampling. This cost figure does not reflect the total number of additional citations resulting from the proposed SS rule.

[b] Sampling costs below were derived using the sampling percentages for the three different sampling scenarios shown in Table IV-12.

$67.84 = (0.63 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$13.81 filter))+(0.33 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$78.75 equip.))+(0.04 x $210)

$65.89 = (0.66 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$13.81 filter))+(0.30 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$78.75 equip.))+(0.04 x $210)

$39.59 = (0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$13.81 filter

$124.88 = (0.45 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$13.81 filter))+(0.08 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$78.75 equip.))+(0.47 x $210)

$97.69 = (0.56 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$13.81 filter))+(0.16 x ((0.8333 hr. x $19.95 wage) +(0.1666 hr. x $54.92 wage)+$78.75 equip.))+(0.28 x $210)

Existing §§ 70.209(a) & (c), 71.209(a) & (c), & 90.209(a) & (c)
Annual Costs for Completing Dust Data Cards Due to Additional SS Citations, and Sending Samples and Dust Data Cards to MSHA

As noted earlier, a completed dust data card accompanies each abatement sample mailed to the MSHA laboratory for analysis. The dust data card is provided by the manufacturer with each filter cassette. For the additional SS citations issued to operators that contract out their sampling, there are no separate costs shown in this PREA for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. These costs are included in the $210 charged by the contractor, which includes collecting the sample; completing the dust data card; and sending the sample and dust data card to MSHA. Therefore, for additional SS citations issued to operators that contract out their sampling responsibilities, the costs for completing dust data cards and sending them along with the samples to MSHA were already included in the abatement sampling costs derived in Table IV-13. Table IV-14 shows the additional SS citations to be issued to operators that conduct their own sampling.

Table IV-14: Number of Additional SS Citations Associated With Mines That Conduct Their Own Sampling

Size Category	(a) Additional SS Citations from Table IV-3	(b) Additional SS Citations That Need a 2nd Set of Abatement Samples Table IV-8	(c) Additional SS Citations (a) + (b) [a]	(d) Percentage of Additional SS Citations Associated with Mines that Perform Their Own Sampling	(e) Additional SS Citations Associated with Mines That Conduct Their Own Sampling (c) x (d)
Underground Coal Mines					
<20 emp.	121	7	128	96%	123
20 to 500 emp. no lgwl	623	20	643	96%	617
20 to 500 emp. lgwl	85	3	88	100%	88
Sub-total	708	23	731		705
>500 emp. no lgwl	28	2	30	100%	30
>500 emp. lgwl	4	0	4	100%	4
Sub-total	32	2	34		34
Total Ug. Citations					862
Surface Coal Mines					
<20 emp.	21	0	21	53%	11
20 to 500 emp.	27	0	27	72%	19
>500 emp.	0	0	0	100%	0
Total Surf. Citations					31

[a] The total additional SS citations that are anticipated as a result of the proposed SS rule are listed in column (a). The citations in column (b) are a subset of those listed in column (a) that need a second set of 5 abatement samples. Columns (b) and (c) are added together in order to determine certain compliance costs, such as the cost of abatement sampling; completing dust data cards, sending dust data cards and samples to MSHA for analysis, and posting of sample results.

On each dust data card, the person collecting the sample writes information on the card about the production conditions under which the sample was collected. After filling out the dust data card, the certified person signs the card and writes the certification number on it. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. The hourly wage rate of a mine safety inspector is the same as a mine supervisor's hourly wage rate of $54.92.

Each abatement sample along with the dust data card must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60.

Table IV-15 shows operators' annual costs to complete dust data cards that accompany abatement samples, and mail the dust cards and samples, that are due to additional SS citations.

Table IV-15: Existing 70.209(a) & (c), 71.201(a) & (c) & 90.201(a) & (c)
Total Annual Abatement Costs to Complete Dust Data Cards and
Send Cards and Samples to MSHA for Analysis
(for Mines That Conduct Their Own Sampling)

Size Category	No. of Additional SS Citations[a]	No. of Samples and Dust Cards per Citation	Cost to Complete Dust Card and Send Card and Sample to MSHA[b]	Total Annual Costs
Underground Coal Mines				
<20 emp.	123	5	$3.97	$2,438
20 to 500 emp. no lgwl	617	5	$3.97	$12,248
20 to 500 emp. lgwl	88	5	$3.97	$1,745
Sub-total	705			$13,993
>500 emp. no lgwl	30	5	$3.97	$598
>500 emp. lgwl	4	5	$3.97	$76
Sub-total	34			$675
Total Ug. Annual Costs				$17,105
Surface Coal Mines				
<20 emp.	11	5	$3.97	$221
20 to 500 emp.	19	5	$3.97	$386
>500 emp.	0	5	$3.97	$0
Total Surf. Annual Costs				$607

[a] Citations from Table IV-14.

[b] $3.97 = (0.025 hrs. x $54.92 hourly wage) + (0.1 hrs. x $19.95 hourly wage) +$0.60.

Existing §§ 70.210(b), 71.210(b), & 90.210(b) Annual Cost to Post Abatement Sample Results Due to Additional SS Citations

After processing the abatement samples, the Agency sends the sampling results to the affected operator. Upon receipt of the results, the operator must post the one page report on the mine bulletin board for at least 31 days. MSHA estimates that a clerical worker takes approximately 0.1 hours (6 minutes) to copy and post the one page summary of the sample results. Photocopying costs are estimated to be $0.15 per page.

Existing § 90.210(b) prohibits operators from posting the abatement sampling results related to part 90 citations. Instead, the operator provides a copy of the sampling results to the affected part 90 miner. For purposes of this cost analysis, MSHA assumes that it takes the same amount of time to provide a copy of the sampling results to the affected part 90 miner as it would to post the sampling results on the mine bulletin board.

Operators' costs to copy and post abatement sampling results affect both operators that conduct their own sampling and operators that contract out their sampling. The costs related to posting sample results are not included in the sampling fee charged to operators that contract out their sampling responsibilities.

Table IV-16 shows operators' annual costs to copy and post (or provide to the affected part 90 miner) abatement sampling results due to the additional SS citations.

Table IV-16: Existing 70.210(b), 71.210(b), & 90.210(b)
Total Annual Costs to Post Abatement Sample
Results that Are Due to Additional SS Citations

Size Category	No. of Additional SS Citations[a]	Cost to Post Sample Results Per Citation[b]	Total Annual Costs
Underground Coal Mines			
<20 emp.	128	$2.11	$270
20 to 500 emp. no lgwl	643	$2.11	$1,356
20 to 500 emp. lgwl	88	$2.11	$185
Sub-total	731		$1,541
>500 emp. no lgwl	30	$2.11	$64
>500 emp. lgwl	4	$2.11	$8
Sub-total	34		$72
Total Ug. Annual Costs			$1,882
Surface Coal Mines			
<20 emp.	21	$2.11	$44
20 to 500 emp.	27	$2.11	$57
>500 emp.	0	$2.11	$0
Total Surf. Annual Costs			$101

[a] Cittions from Table IV-14.

[b] $2.11 = (0.1 hr. x $19.58)+(1 pg. x $0.15).

Annual Penalty Costs Due to Additional SS Citations

Operators cited for a violation of the applicable dust standard are issued a citation and assessed a civil penalty. Even if the violation is successfully abated, the operator is still obligated to pay the civil penalty.[34] The dollar amount that is assessed for each violation varies and is based on a set of criteria presented in 30 CFR §100.3. Table IV-17 shows average penalties assessed for each type of entity that was recently cited. These dollar amounts were provided by MSHA's Office of Coal Mine Safety and Health.

Table IV-17: Average Penalty Assessed Per Additional SS Citation

Penalty Fees [a]							
Size Category	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP
Underground Coal Mines							
<20 emp.	$525	$400	$267	$63	$696	$181	$181
20 to 500 emp.	$2,700	$1,535	$430	$430	$696	$454	$280
>500 emp.	$1,495		$267				
Surface Coal Mines							
<20 emp.						$181	$181
20 to 500 emp.						$454	$280
>500 emp.							

[a] Penalty assessments provided by MSHA's Office of Coal Mine Safety and Health. Samples at surface coal mines taken only at DWPs and NDWPs; therefore surface coal mine penalties apply only to DWPs and NDWPs.

Civil penalty costs in Table IV-17 were applied to the additional SS citations shown in Table IV-2 to arrive at the annual civil penalty costs shown in Table IV-18. Penalty costs are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost), but merely a transfer payment to the government from a party violating a rule and thus receiving a citation. Therefore, the penalty costs shown in Table IV-18, and any other penalty costs estimated in this PREA, are excluded as part of the costs of the proposed SS or PV rules. However, these penalty costs are relevant in determining the economic feasibility of these rules. Therefore, penalty costs

[34] When the operator receives a citation, the operator must pay a civil penalty after the violation has been abated. If the operator fails to abate the violation based on the first set of five abatement sample results, then subsequent sets of five abatement samples are taken until the sampling results indicate that the violation has been abated. Once the operator is cited, no additional citations are issued for the initial violation even if abatement sample results continue to show noncompliance. The initial violation must be abated before the operator can be cited again for noncompliance.

will be considered as part of the mining industry costs associated with these rules in MSHA's evaluations of economic feasibility at the end of this chapter.

Table IV-18: Average Penalty Costs Due to Additional SS Citation

Penatly Fees [a]								
Size Category	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total Charges
Underground Coal Mines								
<20 emp.	$49,875	$8,000	$534	$63	$2,088	$0	$0	$60,560
20 to 500 emp.	$1,398,600	$207,225	$12,040	$8,170	$4,872	$454	$0	$1,631,361
>500 emp.	$38,870	$0	$1,602	$0	$0	$0	$0	$40,472
Total Ug.	$1,487,345	$215,225	$14,176	$8,233	$6,960	$454	$0	$1,732,393
Surface Coal Mines								
<20 emp.						$2,353	$1,448	$3,801
20 to 500 emp.						$6,810	$3,360	$10,170
>500 emp.						$0	$0	$0
Total Surf.						$9,163	$4,808	$13,971

[a] Penalty costs were derived by multiplying the additional SS citations in Table IV-2 by the average penalty costs per citation in Table IV-17.

Summary of Cost Increases Related to the Proposed SS Rule

Table IV-19 provides a summary of the estimated annual costs of complying with the SS rule.[35] These costs are attributable to the additional SS citations that are anticipated under the proposed SS rule. Table IV-20 summarizes the civil penalty costs due to the additional SS citations. As previously noted, these penalty costs are not included as part of the costs of the proposed SS rule.

[35] The SS compliance costs in this PREA are approximately 71 percent higher than those estimated in the PREA supporting the July 7, 2000 rule. The reason for this is due primarily to the fact that the number of additional citations estimated in this PREA are 62 percent higher than those estimated in the PREA supporting the July 7, 2000 rule.

Table IV-19: Summary of Estimated Yearly Costs Due to Additional SS Citations [a]

Estimated Costs by Category	<20 emp.	20 to 500 emp.	>500 emp.	Total
Underground Coal Mines				
Corrective Actions [b]	$370,226	$2,247,736	$99,686	$2,717,648
Dust Plan Revisions	$659	$8,677	$330	$9,666
Mail Plan Revisions	$116	$785	$30	$930
Post or Provide Dust Plan	$125	$845	$32	$1,001
Abatement Sampling	$43,414	$229,250	$6,730	$279,395
Complete Dust Cards and Mail Cards & Samples	$2,438	$13,993	$675	$17,105
Post Sample Results	$270	$1,541	$72	$1,882
Total	$417,248	$2,502,826	$107,554	$3,027,627
Surface Coal Mines				
Corrective Actions	$7,680	$19,749	$0	$27,429
Dust Plan Revisions	$577	$1,483	$0	$2,060
Mail Plan Revisions	$101	$134	$0	$235
Post or Provide Dust Plan	$109	$144	$0	$253
Abatement Sampling	$13,112	$13,189	$0	$26,301
Complete Dust Cards and Mail Cards & Samples	$221	$386	$0	$607
Post Sample Results	$44	$57	$0	$101
Total	$21,844	$35,141	$0	$56,985
Underground and Surface Coal Mines				
Corrective Actions	$377,906	$2,267,484	$99,686	$2,745,076
Dust Plan Revisions	$1,236	$10,160	$330	$11,725
Mail Plan Revisions	$217	$919	$30	$1,165
Post or Give Dust Plan	$234	$989	$32	$1,255
Abatement Sampling	$56,526	$242,439	$6,730	$305,695
Complete Dust Cards and Mail Cards & Samples	$2,659	$14,378	$675	$17,712
Post Sample Results	$314	$1,598	$72	$1,984
Total	$439,092	$2,537,967	$107,554	$3,084,613

[a] Source: Tables IV-6, IV-8, IV-9, IV-10, IV-11, IV-13, IV-15, and IV-16. Note that yearly costs equal annualized costs plus annual costs..

[b] Includes corrections taken before first and second sets of abatement sampling.

Table IV-20: Summary of Estimated Annual Penalty Costs Due to Additional SS Citations [a]

Detail	<20 emp.	20 to 500 emp.	>500 emp.	Total
Penalty Costs				
Underground Coal Mines	$60,560	$1,631,361	$40,472	$1,732,393
Surface Coal Mines	$3,801	$10,170	$0	$13,971
All Coal Mines	$64,361	$1,641,531	$40,472	$1,746,364

[a] Source: Tables IV-18.

As a result of the plan verification (PV) rule, operators' mine ventilation plans would be designed to control respirable dust within the applicable standard on each shift. With well designed ventilation plans, MSHA anticipates issuing fewer citations to MMUs and RB-DAs based on single-sample results. Also, there should be a decrease in the number of I-DA, O-DA, P-90, DWP, and NDWP citations, but to a lesser extent.

As a result, the total operators costs associated with the additional SS citations, that are discussed above, would be offset by the proposed PV rule. The magnitude of this SS cost reduction is estimated in Part 2 of this chapter.

PART 2 - ESTIMATED COMPLIANCE COSTS OF THE PROPOSED PLAN VERIFICATION (PV) RULE

PV Costs by Provision

Before deriving the cost of the proposed PV rule, the method for handling some types of costs requires explanation. In a few cases, the proposed PV rule imposes compliance costs that would be the same every year, beginning with the first year that the rule takes effect. These are "annual costs," as traditionally defined. In most cases, however, the proposed PV rule imposes costs which would be the same each year starting with the second year the PV rule is in effect, but whose first year costs would be different. MSHA separated these first year costs into two parts: (1) an amount equal to annual costs starting with Year 2 after the rule takes effect and (2) the residual, which we term "adjusted" first year costs.[36] The adjusted first year costs could then be annualized and added to annual costs (all beginning in the first year the rule takes effect) in order to arrive at yearly costs. As a result, yearly costs begin in the first year that the rule takes effect and are the same every year thereafter.

How Many Rounds of Plan Verification Sampling Are Anticipated to Occur

All underground coal operators would be required to have a verified ventilation plan. Operators would collect full production-shift respirable dust samples, called "verification samples," in each mechanized mining unit, or MMU,[37] to demonstrate the adequacy of the dust control parameters specified in the mine ventilation plan. A round is the sampling of a shift or series of shifts until the required number of valid samples are collected and the resulting dust-concentration measurements are at or below the specified critical values in the proposed PV rule.

[36] A hypothetical example might help to explain this procedure. Suppose that compliance costs are $2,000 the first year and $400 each year thereafter. The adjustment procedure simply splits first year compliance costs into two parts: (1) $400, for the first year of annual costs; and (2) the residual $1,600. Consequently, adjusted first year costs would be $1,600 and annual costs (starting in year 1) would be $400.

[37] An MMU uses a unit of mining equipment for the production of material.

If the measurements exceed the critical values then another round of sampling would be required.[38]

To be considered a valid verification sample, the sample must be taken on a shift during which the amount of material produced by an MMU is at or above the verification production level (VPL). The VPL is defined in the proposed PV rule as the tenth highest production level recorded in the most recent thirty production shifts. In addition, a valid sample must initially be taken on a shift using only the engineering (or environmental) controls, and other measures included in the ventilation plan, at levels not exceeding 115 percent of the quantities specified in the plan.[39] For the ventilation plan to be verified as being effective, each verification sample must be at or below the critical values in proposed § 70.207of the PV rule. Any further reference, in this document, to the critical values in proposed § 70.207 will be recognized as just "critical values."

It is important to discuss MSHA's estimate of the number of rounds of verification sampling expected to occur, for each MMU, to verify the effectiveness of the mine ventilation plan in controlling respirable dust. The number of rounds of verification sampling is directly related to some of the operators' plan verification compliance costs, such as revising the ventilation plan, sending the plan to MSHA for review and approval, and posting the revised ventilation plan revisions on the mine bulletin board. Therefore, the following discussion focuses on the anticipated number of rounds of verification sampling needed to verify an initial ventilation plan. It does not focus on the number of verification samples that need to be taken every time such sampling is conducted, nor on the number of shifts needed to be sampled in order to verify the ventilation plan. These will be addressed later as they apply to the determination of other operator compliance costs.

First Year PV Rule is in Effect

During the first round of verification sampling, MSHA assumes that operators would not be able to obtain valid verification samples for all MMUs that are at or below the critical values noted in the proposed PV rule. After the first round of verification sampling, sample results from some MMUs would fail to be at or below the critical values listed in the proposed PV rule. For these MMUs, a second round of verification sampling would be needed in order to obtain valid verification samples whose results are at or below the critical values in the proposed PV

[38] For example, based on the critical values in §70.207, if any shift sample result(s) exceeds 2.0 mg/m^3 for respirable coal mine dust, then another round of sampling is needed. If on the first shift sampled the operator's sample results are between 1.71 mg/m^3 and 1.85 mg/m^3 for respirable coal mine dust, then a second shift of sampling, within the first round, is required. If valid sample result(s) are between 1.85 mg/m^3 and 1.93 mg/m^3 or 1.93 mg/m^3 and 2.0 mg/m^3, then additional shifts of sampling, up to a maximum of four shifts, could be sampled within the first round.

[39] Specifically, §70.2 states that a valid sample is a respirable dust sample collected and submitted as required by part 70, and not voided by MSHA.

rule. However, MSHA further assumes that some of the MMUs involved in a second round of verification sampling would have valid verification sample results that would still not meet the critical values stated in the proposed PV rule. The MMUs in this situation would need a third round of verification sampling. MSHA assumes that all MMUs involved in a third round of verification sampling would obtain valid samples whose results would meet the critical values noted in the proposed rule. No MMU is assumed to need a fourth round of verification sampling when operators are originally verifying mine ventilation plans.

The number of MMUs involved in a first, second, and third round of verification sampling is shown in Table IV-21.

Table IV-21: Failure Schedule for the First Year That Plan Verification Rule is in Effect

Ug. Coal Mines Verification Process	Non-Longwall MMUs in Mines That Employ <20 Workers[a]	Non-Longwall MMUs in Mines That Employ 20 to 500 Workers[b]	Longwall MMUs in Mines That Employ 20 to 500 Workers[c]	Non-Longwall MMUs in Mines That Employ >500 Workers[b]	Longwall MMUs in Mines That Employ >500 Workers[c]
1st Round	200	560	42	23	8
Percentage of MMUs that Fail After Each Attempt to Reverify					
Fail 1st Round (need 2nd Round)	25%	25%	66%	25%	60%
Fail 1st & 2nd Rounds (need 3rd Round)	8%	11%	79%	7%	83%
Fail 1, 2, & 3rd Rounds (need 4th Round)	0%	0%	0%	0%	0%
Number of MMUs That Fail Based on Above Percentages					
Fail 1st Round (need 2nd Round)	50.0	140.0	27.7	5.8	4.8
Fail 1st & 2nd Rounds (need 3rd Round)	4.0	15.0	22.0	0.4	4.0
Fail 1, 2, & 3rd Rounds (need 4th Round)	0	0	0	0	0

Source: Percentages provided by MSHA's Office of Coal Mine Safety and Health.

[a] There are no longwall operations in mines employing fewer than 20 workers.

[b] For mines with longwall operations, this category includes the continuous mining units that support the longwall operation but does not include the actual longwall operation.

[c] The MMUs in this category contain only the actual longwall operations in longwall mines.

The data in Table IV-21 can be interpreted in the following manner:

- There are 200 MMUs in underground coal mines employing fewer than 20 workers that would need their ventilation plans verified in the first year the rule takes effect. Of these, it is estimated that 25 percent (50 MMUs) would submit valid verification samples that fail to meet the critical values on the first round and therefore would require a second round of verification sampling. Approximately eight percent of those that failed the first time would fail a second time (4 MMUs) and would require a third round of verification sampling. For the 4 MMUs, involved in a third round of verification sampling MSHA assumes that, in order to obtain valid verification samples that meet the critical values, 3 MMUs would require some miners to use administrative controls, and 1 MMU would require the miners to use powered air-purifying respirators (PAPRs).

- There are 560 MMUs in non-longwall underground coal mines employing 20 to 500 workers that would need their ventilation plans verified in the first year that the rule takes effect. Of these, 25 percent (140 MMUs) would submit valid verification samples that fail to meet the critical values on the first round and therefore would require a second round of verification sampling. Approximately 11 percent of those that failed the first time would fail again the second time (15 MMUs) and would require a third round of verification sampling. For the 15 MMUs, involved in a third round of verification sampling, MSHA assumes that, in order to obtain valid verification samples that meet the critical values noted, 10 MMUs would require some miners to use administrative controls, and 5 MMUs would require some miners to use PAPRs.

- There are an additional 42 MMUs in longwall underground coal mines employing 20 to 500 workers that would need their ventilation plans verified in the first year that the rule takes effect. Of these, 66 percent (27.7 MMUs) would obtain valid verification samples that fail to meet the critical values on the first round and therefore would require a second round of verification sampling. Approximately 79 percent of those that failed the first time would fail again the second time (22 MMUs) and would require a third round of verification sampling. For the 22 MMU involved in a third round of verification sampling, MSHA assumes that, in order to obtain valid verification samples that meet the critical values, 5 MMUs would require some miners to use administrative controls, and 17 MMUs would require some miners to use PAPRs.

- There are 23 MMUs in non-longwall underground coal mines employing more than 500 workers that would need their ventilation plans verified in the first year

that the rule takes effect. Of these, 25 percent (5.8 MMUs) would obtain valid verification samples that fail to meet the critical values on the first round and therefore would require a second round of verification sampling. Approximately seven percent of those that failed the first time would fail again the second time (0.4 MMU) and would require a third round of verification sampling. No MMU involved in a third round of sampling would require administrative controls or PAPRs.

- There are an additional 8 MMUs in longwall underground coal mines employing more than 500 workers that would have their ventilation plans verified in the first year that the rule takes effect. Of these, 60 percent (4.8 MMUs) would obtain valid verification samples that fail to meet the critical values on the first round and therefore would require a second round of verification sampling. Approximately 83 percent of those that failed the first time would fail again the second time (4 MMUs) and would require a third round of verification sampling. For the 4 MMUs involved in a third round of verification samples, MSHA assumes that, in order to obtain valid verification samples that meet the critical values, some miners would need to use PAPRs.

After First Year PV Rule Is in Effect

MSHA expects that all mine operators would have a verified ventilation plan by the end of the first year in which the proposed PV rule takes effect. Beginning in the second year of the PV rule, after the ventilation plans have been verified, an operator could receive a citation that would initiate the re-verification of the ventilation plan. In addition, after the first year, any new MMUs would also need to verify their ventilation plan. MSHA's Office of Coal Mine Safety and Health estimates that, in the second year of the rule and for every year thereafter, 15 percent of the MMUs would require re-verification or initial verification of their ventilation plans. After the first year that the PV rule is in effect, MSHA assume that whenever an MMUs is involved in a re-verification or an original verification of a mine ventilation plan, the plan would be verified in the first round of sampling.

Table IV-22 shows, by mine size, the estimated number of MMUs associated with re-verification or initial verification of ventilation plans beginning in the second year and in each succeeding year.

Table IV-22:
Annual Number of MMUs Needing
Verification After First Year PV is in Effect

Ug. Coal Size Category	No. of MMUs Needing Re-Verification in Second Year and Every Year Thereafter [a]
<20 emp.	30
20 to 500 emp. no lgwl	84
20 to 500 emp. lgwl	6
Sub-total	90
>500 emp. no lgwl	3
>500 emp. lgwl	1
Sub-total	5
Total	125

[a] Number verified = (0.15 x m), where m is the number of MMUs from Table IV-21.

Existing § 75.370 Pursuant to Proposed § 70.205
Costs to Write a Revised Mine Ventilation Plan

As noted earlier, certain operator compliance costs are directly related to the number of rounds of verification or re-verification sampling estimated to occur. For example, before a round of verification sampling occurs, an operator would incur compliance costs to revise the ventilation plan, to send the ventilation plan to MSHA, and to post the ventilation plan on the mine bulletin board. Also, if more than one round of verification sampling is needed, the operator would incur costs related to taking corrective action.

As a result of the proposed PV rule, MSHA assumes that all underground coal operators would revise their mine ventilation plans (under existing §75.370) before the first round of verification sampling (required by §70.205) could be conducted. After the first round of verification sampling, MSHA estimates that some operators (as noted in Table IV-21) would be involved in a second and third round of verification sampling. In addition, some MMUs would require re-verification of the mine ventilation plan (as noted in Table IV-22). On average, MSHA estimates that, to revise the ventilation plan before a round of sampling, a mine supervisor would require 5 hours in mines employing fewer than 20 workers; 6 hours in mines employing 20 to 500 workers; and 7 hours in mines employing more than 500 workers.

Table IV-23 shows, by size category, underground coal operators' first year costs for writing revised ventilation plans for MMUs prior to the first, second, and third rounds of original verification sampling.

Table IV-24 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for writing revised ventilation plans for MMUs prior to verification of the mine ventilation plan.

Table IV-23: Existing 75.370 Pursuant to Proposed 70.205
First Year Costs to Write Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Revised Plan Per MMU Costs [b]	Revised Plan Costs 1st Round	Revised Plan Costs 2nd Round [c]	Revised Plan Costs 3rd Round [c]	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	200	$274.60	$54,920	$13,730	$1,098	$69,748	$8,238	$61,510	4,306
20 to 500 emp. no lgwl	560	$329.52	$184,531	$46,133	$4,943	$235,607	$27,680	$207,927	14,555
20 to 500 emp. lgwl	42	$329.52	$13,840	$9,134	$7,249	$30,224	$2,076	$28,148	1,970
Sub-total	602		$198,371	$55,267	$12,192	$265,830	$29,756	$236,075	$16,525
>500 emp. no lgwl	23	$384.44	$8,842	$2,211	$155	$11,207	$1,326	$9,881	692
>500 emp. lgwl	8	$384.44	$3,076	$1,845	$1,538	$6,459	$461	$5,997	420
Sub-total	31		$11,918	$4,056	$1,692	$17,666	$1,788	$15,878	$1,111
Total			$265,209	$73,053	$14,983	$353,245	$39,781	$313,463	$21,942

[a] Source: Table IV-21.

[b] Cost per MMU = (r x $54.92); where r is the number of hours estimated for a supervisor to revise a ventilation plan, and r = 5 in mines that employ <20 workers, r = 6 in mines that employ between 20 and 500 workers, and r = 7 in mines that employ more than 500 workers; and $54.92 is the hourly wage rate for a coal mine supervisor.

[c] Costs derived by multiplying percentages in Table IV-21 by costs found in this table under the heading "Revised Plan Costs 1st Round."

[d] An amount equivalent to annual costs from Table IV-24.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-24: Existing 75.370 Pursuant to Proposed 70.205
Annual Costs to Write Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Cost to Revise Ventilation Plan Per MMU [b]	Total Annual Costs
<20 emp.	30	$274.60	$8,238
20 to 500 emp. no lgwl	84	$329.52	$27,680
20 to 500 emp. lgwl	6	$329.52	$2,076
Sub-total	90		$29,756
>500 emp. no lgwl	3	$384.44	$1,326
>500 emp. lgwl	1	$384.44	$461
Sub-total	5		$1,788
Total Annual Costs			$39,781

[a] Source: Table IV-22.

[b] Revised ventilation plan costs per MMU from Table IV-23.

Existing § 75.370(a)(2) and (a)(3)(i)
Costs to Copy and Send Revised Ventilation Plan to MSHA and the Miners' Representative

A copy of revisions to the mine's ventilation plan would need to be sent to the appropriate MSHA District Manager and to the miners' representative. MSHA estimates that a clerical worker would take 0.2 hours (12 minutes) to copy and send in a revised ventilation plan. On average, the estimated length of a ventilation plan is assumed to be 3 pages for operators employing fewer than 20 workers, and 6 pages for operators employing 20 or more workers. Photocopying costs are estimated to be $0.15 per page. Postage costs are estimated to be $1 to send in a revised ventilation plan.

Table IV-25 shows, by size category, underground coal operators' first year costs to copy and send revised ventilation plans to the MSHA District Manager and the miners' representative that are related to the first, second, and third rounds of the original verification sampling.

Table IV-26 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year as derived in the previous table) to copy and send revised ventilation plans to the MSHA District Manager and the miners' representative.

Table IV-25: Existing 75.370(a)(2) & (a)(3)(i)
First Year Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Cost to Copy & Send Plan Per MMU [b]	Cost to Copy & Send Plan 1st Round	Costs to Copy & Send Plan 2nd Round [c]	Costs to Copy & Send Plan 3rd Round [c]	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	200	$10.73	$2,146	$537	$43	$2,726	$322	$2,404	$168
20 to 500 emp. no lgwl	560	$11.63	$6,514	$1,628	$174	$8,317	$977	$7,340	$513.79
20 to 500 emp. lgwl	42	$11.63	$489	$322	$256	$1,067	$73	$994	$69.55
Sub-total	602		$7,002	$1,951	$430	$9,384	$1,050	$8,333	$583
>500 emp. no lgwl	23	$11.63	$268	$67	$5	$339	$40	$299	$20.93
>500 emp. lgwl	8	$11.63	$93	$56	$47	$195	$14	$181	$12.70
Sub-total	31		$361	$123	$51	$535	$54	$480	$34
Total			$9,509	$2,610	$525	$12,644	$1,426	$11,218	$785

[a] Source: Table IV-21.

[b] Cost per MMU = ((0.2 x $19.58) + ($0.15 x p) + $1) x 2: where 0.2 hrs. is the time for a clerical worker to copy and send in a ventilation plan; $19.58 is clerical worker's hourly wage rate; $0.15 is photocopy costs per page; p is the number of pages to copy (3 pages for mines employing <20 workers, and 6 pages for mines employing ≥20 workers); $1 is for postage; and 2 is the number of plans to mail.

[c] Costs derived by multiplying percentage in Table IV-21 by costs found in this table under the heading "Costs to Copy and Send Plan 1st Round."

[d] An amount equivalent to annual costs from Table IV-26.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-26: Existing 75.370(a)(2) & (a)(3)(i)
Annual Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Copy & Send Plan Costs Per MMU [b]	Total Annual Costs
<20 emp.	30	$10.73	$322
20 to 500 emp. no lgwl	84	$11.63	$977
20 to 500 emp. lgwl	6	$11.63	$73
Sub-total	90		$1,050
>500 emp. no lgwl	3	$11.63	$40
>500 emp. lgwl	1	$11.63	$14
Sub-total	5		$54
Total Annual Costs			$1,426

[a] Source: Table IV-22.

[b] Cost per MMU to copy and send revised ventilation plan from Table IV-25.

Existing § 75.370(a)(3)(iii)
Costs to Post Revised Ventilation Plan

Underground coal operators must post a copy of the mine ventilation plan revisions on the mine bulletin board. Since the proposed PV rule will cause operators to revise their ventilation plans, they would need to post the revised ventilation plan on the mine bulletin board.

MSHA estimates that a clerical worker would take 0.1 hours (6 minutes) to copy and post a ventilation plan. On average, the estimated length of a ventilation plan is 3 pages for operators employing fewer than 20 workers and 6 pages for operators employing 20 or more workers. Photocopying costs are estimated to be $0.15 per page.

Table IV-27 shows, by size category, underground coal operators' first year costs to copy and post revised ventilation plans related to the first, second, and third rounds of original verification sampling.

Table IV-28 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year as derived in the previous table) to copy and post revised ventilation plans.

Table IV-27: Existing 75.370(a)(3)(iii)
First Year Costs to Post Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Cost to Post Plan Per MMU [b]	Post Plan Costs 1st Round	Post Plan Costs 2nd Round [c]	Post Plan Costs 3rd Round [c]	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	200	$2.41	$482	$120	$10	$612	$72	$539	$38
20 to 500 emp. no lgwl	560	$2.86	$1,600	$400	$43	$2,043	$240	$1,803	$126
20 to 500 emp. lgwl	42	$2.86	$120	$79	$63	$262	$18	$244	$17
Sub-total	602		$1,721	$479	$106	$2,306	$258	$2,048	$143
>500 emp. no lgwl	23	$2.86	$66	$16	$1	$83	$10	$73	$5
>500 emp. lgwl	8	$2.86	$23	$14	$11	$48	$3	$45	$3
Sub-total	31		$89	$30	$13	$131	$13	$118	$8
Total Costs			$2,291	$630	$128	$3,049	$344	$2,705	$189

[a] Source: Table IV-21.

[b] Cost per MMU = (0.1 x $19.58) + ($0.15 x p), where 0.1 hrs. is the time for a clerical worker to copy and post ventilation plan; $19.58 is the clerical worker's hourly wage rate; $0.15 is photocopying costs per page; p is the number of pages to copy, p=3 for MMUs in mines employing <20 workers and p=6 for MMUs in mines employing ≥20 workers.

[c] Costs derived by multiplying percentages in Table IV-21 by costs found in this table under the heading "Post Plan Costs 1st Round."

[d] An amount equivalent to annual costs from Table IV-28.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-28: Existing 75.370(a)(3)(iii)
Annual Costs to Post Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs[a]	Post Plan Costs Per Mine [b]	Total Annual Costs
<20 emp.	30	$2.41	$72
20 to 500 emp. no lgwl	84	$2.86	$240
20 to 500 emp. lgwl	6	$2.86	$18
Sub-total	90		$258
>500 emp. no lgwl	3	$2.86	$10
>500 emp. lgwl	1	$2.86	$3
Sub-total	5		$13
Total Annual Costs			$344

[a] Source: Table IV-22.

[b] Cost to post plan per MMU from Table IV-27.

Proposed §75.370(h)
Record of Material Produced

Section 75.370(h) requires that operators keep records of the amount of material produced by each MMU for six months. This record must be made available for inspection by authorized representatives of the Secretary and the miners' representative. Since for business purposes operators already maintain a record of the amount of material produced on each shift, this provision would not impose any additional costs on operators.

Proposed §70.201(f)
Cost to Notify Miners and their Representative of Verification Sampling

Paragraph (f) requires that operators give affected miners and their representatives prior notice of the date and time of intended sampling. With respect to plan verification sampling, all miners and their representatives would have to be notified. This notification would be provided each time an MMU is involved in plan verification sampling. Table IV-21 shows the number of MMUs and rounds of verification sampling estimated to occur during the first year that the PV rule is in effect, while Table IV-22 shows the estimated number of MMUs for which operators need to conduct plan verification sampling in the second year, and every year thereafter, that the PV rule is in effect. MSHA estimates that a clerical worker would take 0.2 hours (12 minutes) to write and then post the required information.

Table IV-29 shows, by size category, underground coal operators' first year costs for notification prior to the first, second, and third rounds of original verification sampling.

Table IV-30 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year derived in the previous table) for verification sampling notification.

Table IV-29: Existing 70.201(f)
First Year Costs for Notification of Plan Verification Sampling

Ug. Coal Size Category	No. of MMUs [a]	Costs to Notify Per MMU [b]	Costs to Notify 1st Round	Costs to Notify 2nd Round [c]	Costs to Notify 3rd Round [c]	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	200	$3.92	$783	$196	$16	$995	$117	$877	$61
20 to 500 emp. no lgwl	560	$3.92	$2,193	$548	$59	$2,800	$329	$2,471	$172.97
20 to 500 emp. lgwl	42	$3.92	$164	$109	$86	$359	$25	$335	$23.42
Sub-total	602		$2,357	$657	$145	$3,159	$354	$2,806	$196
>500 emp. no lgwl	23	$3.92	$90	$23	$2	$114	$14	$101	$7.05
>500 emp. lgwl	8	$3.92	$31	$19	$16	$66	$5	$61	$4.28
Sub-total	31		$121	$41	$17	$180	$18	$162	$11
Total			$3,262	$894	$178	$4,334	$489	$3,844	$269

[a] Source: Table IV-21.

[b] Notification costs per MMU = (0.2 x $19.58), where 0.2 hrs. is the time for a clerical worker to write and post the date and time of verification sampling; $19.58 is the clerical worker's hourly wage rate.

[c] Costs derived by multiplying percentages in Table IV-21 by costs found in the table under the heading "Costs to Notify 1st Round."

[d] An amount equivalent to annual costs from Table IV-30.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-30: Proposed 70.201(f)
Annual Costs for Notification of Plan Verification Sampling

Ug. Coal Size Category	No. of MMUs[a]	Notification Costs Per Mine [b]	Total Annual Costs
<20 emp.	30	$3.92	$117
20 to 500 emp. no lgwl	84	$3.92	$329
20 to 500 emp. lgwl	6	$3.92	$25
Sub-total	90		$354
>500 emp. no lgwl	3	$3.92	$14
>500 emp. lgwl	1	$3.92	$5
Sub-total	5		$18
Total Annual Costs			$489

[a] Source: Table IV-22.

[b] Notification costs per MMU from Table IV-29.

MSHA's Estimate of the Number of Samples Taken During Verification Sampling

Operators will incur costs to conduct verification sampling. A preliminary step in the derivation of these costs is to estimate the number of verification samples operators must take. These costs are developed below.

First Year PV Rule Is in Effect - For Non-Longwall MMUs

For a non-longwall MMU involved in the first round of verification sampling, MSHA assumes that: (1) three persons would be sampled on each shift (two roof bolter operators and one designated occupation), and (2) only engineering controls would be used. In addition, MSHA assumes that operators would obtain valid verification samples for each MMU based on sampling anywhere from 1 to 5 shifts.[40] For the first round of verification sampling, for each non-longwall MMU (regardless of mine size), the average number of verification samples estimated to be taken is 4.47 samples. This figure was derived in the following manner:

4.47 = (67% non-lgwl MMUs x 1 shift x 3 workers sampled) +
(22% non-lgwl MMUs x 2 shifts x 3 workers sampled) +
(7% non-lgwl MMUs x 3 shifts x 3 workers sampled) +
(3% non-lgwl MMUs x 4 shifts x 3 workers sampled) +
(1% non-lgwl MMUs x 5 shifts x 3 workers sampled).

During the second round of verification sampling on a non-longwall MMU, MSHA still assumes that: (1) three persons would be sampled on each shift; and (2) only engineering controls would be used. For the third round of verification sampling on a non-longwall MMU, MSHA assumes that: (1) three persons would be sampled on each shift, and (2) some miners on these MMUs would either use administrative controls or PAPRs in order to obtain valid verification samples. However, as noted earlier, for the second and third round of verification sampling, MSHA assumes that operators would obtain valid verification samples after sampling the first shift. Therefore, for the second and third round of verification sampling, the average number of verification samples per non-longwall MMU (regardless of mine size) estimated to be taken is 3 samples. The figure was derived in the following manner:

3 = (1 non-lgwl shift x 3 workers sampled).

[40] The percentage of MMUs that can obtain a valid verification sample between 1 to 5 shifts was obtained from technical staff in MSHA's Office of Coal Mine Safety and Health who have had discussions with MSHA's field staff.

First Year PV Rule Is in Effect - For Longwall MMUs

For operators with a longwall MMU involved in the first round of verification sampling, MSHA assumes that: (1) four persons would be sampled on each shift (three jack setters and one designated occupation, which is usually the tailgate shearer operator); and (2) engineering controls would be used. Again, MSHA assumes that the operator would be able to obtain valid verification samples for each MMU based on sampling anywhere from 1 to 5 shifts. Therefore, during the first round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) estimated to be taken is 5.96 samples. The figure was derived in the following manner:

5.96 = (67% lgwl MMU x 1 shift x 4 workers sampled) +
(22% lgwl MMUs x 2 shifts x 4 workers sampled) +
(7% lgwl MMUs x 3 shifts x 4 workers sampled) +
(3% lgwl MMUs x 4 shifts x 4 workers sampled) +
(1% lgwl MMUs x 5 shifts x 4 workers sampled).

During the second round of verification sampling for a longwall operation, MSHA still assumes that: (1) four persons would be sampled on each shift; and (2) only engineering controls would be used. However, as noted earlier, when operators conduct verification sampling after the first round, MSHA assumes that they would obtain valid verification samples after sampling the first full shift. Therefore, for the second round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) estimated to be taken is 4 samples. The figure was derived in the following manner:

4 = (1 lgwl shift x 4 workers sampled).

For longwall MMUs involved in a third round of verification sampling, MSHA assumes that: (1) some miners on these MMUs would either use administrative controls or PAPRs in order to obtain valid verification samples; and (2) when such controls are used, then five persons (instead of 4) would be sampled on each shift (three jack setters, the headgate longwall operator, and the tailgate longwall operator). Again, when operators conduct verification sampling after the first round, MSHA assumes that they would obtain valid verification samples after sampling the first full shift. Therefore, for the third round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) estimated to be taken is 5 samples. The figure was derived in the following manner:

5 = (1 lgwl shift x 5 workers sampled).

After the First Year the PV Rule Is in Effect

MSHA assumes that for annual verification of mine ventilation plans after the first year the PV rule is in effect, the number of samples taken, on average, for each MMU, would be the same number of samples taken during the first round of original verification sampling. Therefore, the average number of verification samples estimated to be taken is 4.47 samples per non-longwall MMU and 5.96 samples per longwall MMU. These are the number of samples needed in order to obtain valid verification sample results that meet the critical values.

Table IV-31 presents the number of samples estimated to be taken by operators with non-longwall and longwall MMUs in order to verify ventilation plans during the first year the PV rule is in effect, and for every year thereafter.

Table IV-31: Number of Verification Samples That Need to be Taken by MMU Type

MMU Type	During 1st year PV Is in Effect			Annually, After 1st Year PV Rule Is in Effect
	Avg. No. of Samples Taken on 1st Round of Verification Sampling Per MMU	Avg. No. of Samples Taken on 2nd Round of Verification Sampling Per MMU	Avg. No. of Samples Taken on 3rd Round of Verification Sampling Per MMU	Avg. No. of Samples Taken Per MMU
Non-longwalls	4.47	3	3	4.47
Longwalls	5.96	4	5	5.96

During the first year that the proposed PV rule is in effect, the number of verification samples estimated to be taken in each mine size category can be determined by multiplying the average number of verification samples taken per MMU (shown in Table IV-31) by the number of MMUs to be sampled during each round of verification sampling (shown in Table IV-21). Table IV-32 performs this calculation and shows the number of verification samples estimated to be taken for MMUs, for each mine size, for longwall and non-longwall mines, during the first year the proposed PV rule is in effect.

Table IV-32
No. of Verification Samples Taken by Mine Size
During First Year Proposed PV Rule Is in Effect

Rounds of Verification Sampling	No. of Samples Per MMU [a]	<20 emp.		20 to 500 emp.		>500 emp.	
		No. of MMUs Sampled [b]	No. of Samples Taken in First Year [c]	No. of MMUs Sampled [b]	No. of Samples Taken in First Year [c]	No. of MMUs Sampled [b]	No. of Samples Taken in First Year [c]
For Non-Longwall MMUs							
1st Round	4.5	50.0	224	140.0	626	5.8	26
2nd Round	3.0	4.0	12	15.0	45	0.4	1
3rd Round	3.0	0.0	0	0.0	0	0.0	0
Total			236		671		27
For Longwall MMUs							
1st Round	6.0	0.0	0	27.7	165	4.8	29
2nd Round	4.0	0.0	0	22.0	88	4.0	16
3rd Round	5.0	0.0	0	0.0	0	0.0	0
Total			0		253		45

[a] Source: Table IV-31.

[b] Source: Table IV-21.

[c] Number of samples per MMU multiplied by the number of MMUs sampled.

Table IV-33 shows the annual number of verification samples estimated to be taken for MMUs, for each mine size, at longwall and non-longwall mines, beginning in the second year that the proposed PV rule is in effect, and every year thereafter.

Table IV-33:
Annual No. of Verification Samples to be Taken
by Mine Size

Ug. Coal Size Category	MMUs[a]	No. of Samples Taken Annually Per MMU [b]	No. of Samples Taken Annually [c]
<20 emp.	30	4.47	134
20 to 500 emp. no lgwl	84	4.47	375
20 to 500 emp. lgwl	6	5.96	38
Sub-total	90		413
>500 emp. no lgwl	3	4.47	15
>500 emp. lgwl	1	5.96	7
Sub-total	5		23
Total Number of Samples Taken Annually			570

[a] Source: Table IV-22.

[c] Source: Table IV-31.

[c] Number of samples per MMU multiplied by the number of MMUs sampled.

Proposed §70.204
Costs to Conduct Verification Sampling

As noted earlier, when deriving the proposed SS costs, MSHA estimates that, on average, it takes approximately 1 hour to prepare the sampling device and perform the required checks during sampling. This time period includes 0.8333 hours (50 minutes) of a certified dust technician's time to prepare, disassemble, and clean the sampling unit after completion of sampling. In addition, it takes a mine supervisor 0.1666 hours (10 minutes) to make the required operational checks of the sampling device during the shift. The cost per sample when operators either (1) sample with their own equipment; (2) sample with rented equipment; or (3) contract out their sampling responsibilities, is estimated in Table IV-13. The cost of sampling from Table IV-13 and the number of samples from Table IV-32 are used to determine operator costs to conduct verification sampling.

Table IV-34 shows, by size category, underground coal operators' first year costs to conduct plan verification sampling.

Table IV-35 shows, by size category, underground coal operators annual costs (including an equivalent amount for the first year derived in the previous table) to conduct plan verification sampling.

Table IV-34: Proposed 70.204
First Year Costs to Conduct Verification Sampling

Ug. Coal Size Category	Total No. of First Year Samples [a]	Cost Per Sample [b]	First Year Costs	Annual Costs [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annual-ized [e]
<20 emp.	236	$67.84	$15,975	$9,097	$6,878	$481
20 to 500 emp. no lgwl	671	$65.89	$44,197	$24,739	$19,458	$1,362
20 to 500 emp. lgwl	253	$39.59	$10,024	$1,486	$8,538	$598
Sub-total	924		$54,221	$26,226	$27,995	$1,960
>500 emp. no lgwl	27	$39.59	$1,065	$611	$455	$32
>500 emp. lgwl	45	$39.59	$1,766	$283	$1,483	$104
Sub-total	72		$2,831	$894	$1,938	$136
Total Costs			$73,027	$36,216	$36,812	$2,577

[a] Source: Table IV-32.

[b] Cost per sample is from Table IV-13.

[c] An amount equivalent to annual costs from Table IV-35.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-35: Propose 70.204
Annual Costs to Conduct Verification Sampling

Ug. Coal Size Category	Total No. of Annual Samples [a]	Cost Per Sample [b]	Annual Costs
<20 emp.	134	$67.84	$9,097
20 to 500 emp. no lgwl	375	$65.89	$24,739
20 to 500 emp. lgwl	38	$39.59	$1,486
Sub-total	413		$26,226
>500 emp. no lgwl	15	$39.59	$611
>500 emp. lgwl	7	$39.59	$283
Sub-total	23		$894
Total Costs			$36,216

[a] Source: Table IV-33.

[b] Cost per sample is from Table IV-13.

Proposed §70.216(a)
Costs for Completing Dust Data Cards for Verification Sampling and Sending Samples and Dust Data Cards to MSHA

A completed dust data card must accompany a verification sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. The hourly wage rate for a mine safety inspector is the same as a mine supervisor's hourly wage rate of $54.92. Each verification sample and its associated dust data card must be sent to MSHA by operators conducting their own sampling. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60.

As noted earlier when deriving the proposed SS costs, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Table IV-12 shows that underground coal mine operators conduct their own sampling in all longwall MMUs in mines employing 20 to 500 workers and all MMUs in mines employing more than 500 workers. Table IV-12 also shows that four percent of underground coal mines contract out their sampling responsibilities for MMUs in mines employing fewer than 20 workers, and non-longwall MMUs in mines employing 20 to 500 workers. Therefore, 96 percent of the verification samples in these two mine size categories impose operator costs for completing dust data cards and sending them along with verification samples to MSHA.

Table IV-36 shows, by size category, underground coal operators' first year costs to complete dust data cards and send them along with their associated samples to MSHA.

Table IV-37 shows, by size category, underground coal operators annual costs (including an equivalent amount for the first year derived in the previous table) to complete dust data cards and send them along with their associated samples to MSHA.

Table IV-36: Proposed 70.216(a)
First Year Costs to Complete Dust Data Cards and
Send Cards and Verification Samples to MSHA for Analysis
(for Mines That Conduct Their Own Verification Sampling)

Ug. Coal Size Category	No. of First Year Samples [a]	Cost to Complete Dust Card & Send Card & Sample to MSHA[b]	First Year Costs	Annual Costs [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annual-ized [e]
<20 emp.	226	$3.97	$897	$511	$386	$27
20 to 500 emp. no lgwl	644	$3.97	$2,555	$1,430	$1,125	$79
20 to 500 emp. lgwl	253	$3.97	$1,005	$149	$856	$60
Sub-total	897		$3,560	$1,579	$1,981	$139
>500 emp. no lgwl	27	$3.97	$107	$61	$46	$3
>500 emp. lgwl	45	$3.97	$177	$28	$149	$10
Sub-total	72		$284	$90	$194	$14
Total Costs	1,195		$4,741	$2,180	$2,561	$179

[a] Source: Table IV-34 (96 percent of estimates for mines with fewer than 20 workers and non-longwall mines employing 20 to 500 workers).

[b] $3.97 = (0.025 hrs. x $54.92 hourly wage) + (0.1 hrs. x $19.95 hourly wage) +$0.60.

[c] An amount equivalent to annual costs from Table IV-37.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-37: Proposed 70.216(a)
Annual Costs to Complete Dust Data Cards and
Send Cards and Verification Samples to MSHA for Analysis
(for Mines That Conduct Their Own Verification Sampling)

Ug. Coal Size Category	No. of Annual Samples [a]	Cost to Complete Dust Card & Send Card & Sample to MSHA[b]	Annual Costs
<20 emp.	129	$3.97	$511
20 to 500 emp. no lgwl	360	$3.97	$1,430
20 to 500 emp. lgwl	38	$3.97	$149
Sub-total	398		$1,579
>500 emp. no lgwl	15	$3.97	$61
>500 emp. lgwl	7	$3.97	$28
Sub-total	23		$90
Total Costs	549		$2,180

[a] Source: Table IV-33. (Estimates for MMUs in mines employing fewer than 20 workers and non-longwall MMUs in mines employing 20 to 500 workers are 96 percent of figures in Table IV-33.)

[b] Cost to complete dust cards and send cards and samples to MSHA from Table IV-36.

Proposed §70.217(b)(1)
Cost to Post Plan Verification Sample Results

After processing the plan verification samples, the Agency sends the sampling results to the affected operator. The operator is required to post the one page verification sample results. Sampling results are posted for each MMU. MSHA estimates that a clerical worker requires 0.1 hours (6 minutes) to copy and post the one page summary of the verification sample results. Photocopying costs are estimated to be $0.15 per page.

Table IV-38 shows, by size category, underground coal operators' first year costs to copy and post plan verification sample results.

Table IV-39 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year derived in the previous table) to copy and post plan verification sample results.

Table IV-38: Proposed 70.217(b)(1)
First Year Costs to Post Ventilation Sample Results

Ug. Coal Size Category	No. of MMUs [a]	Cost to Post Sample Results Per MMU [b]	Costs to Post Sample Results 1st Round	Costs to Post Sample Results 2nd Round [c]	Costs to Post Sample Results 3rd Round [c]	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	200	$2.11	$422	$105	$8	$535	$63	$472	$33
20 to 500 emp. no lgwl	560	$2.11	$1,180	$295	$32	$1,507	$177	$1,330	$93.11
20 to 500 emp. lgwl	42	$2.11	$89	$58	$46	$193	$13	$180	$12.60
Sub-total	602		$1,269	$354	$78	$1,701	$190	$1,510	$106
>500 emp. no lgwl	23	$2.11	$48	$12	$1	$61	$7	$54	$3.79
>500 emp. lgwl	8	$2.11	$17	$10	$8	$35	$3	$33	$2.30
Sub-total	31		$65	$22	$9	$97	$10	$87	$6
Total Costs			$1,756	$481	$96	$2,333	$263	$2,069	$145

[a] Source: Table IV-21.

[b] $2.11 = (0.1 hr. x $19.58) + (1 pg. x $0.15), where 0.1 is the hours to copy and post the sample results, $19.58 is the clerical hourly wage rate, 1 is the number of pages to post, and $0.15 is the photocopy costs per page.

[c] Costs derived by multiplying percentages in Table IV-21 by costs found in this table under the heading "Cost to Post Sample Results 1st Round."

[d] An amount equivalent to annual costs from Table IV-39.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-39: Proposed 70.217(b)(1)
Annual Costs to Post Verification Sample Results

Ug. Coal Size Category	No. of MMUs[a]	Cost to Post Sample Results Per MMU [b]	Total Annual Costs
<20 emp.	30	$2.11	$63
20 to 500 emp. no lgwl	84	$2.11	$177
20 to 500 emp. lgwl	6	$2.11	$13
Sub-total	90		$190
>500 emp. no lgwl	3	$2.11	$7
>500 emp. lgwl	1	$2.11	$3
Sub-total	5		$10
Total Annual Costs			$263

[a] Source: Table IV-22.

[b] Cost to post sample results per MMU from Table IV-38.

Proposed §70.204
Costs to Perform Corrective Actions

As previously noted, during the first year the PV rule is in effect, all operators will not be able to successfully verify their ventilation plans after the first round of verification sampling. For some MMUs, operators will need to conduct additional rounds of verification sampling. Operators will need to take corrective actions before carrying out a second or third round of verification sampling. In addition, corrective actions would need to be taken after the first year whenever plans need to be verified.

Earlier when determining the operator costs for incurring additional SS citations, the operator received a citation when an MSHA inspector sample result showed an overexposure. The operator then took corrective actions to achieve compliance. Under the proposed PV rule, operators would not receive a citation if an operators' verification sample results showed an overexposure. Instead, the operator would be required to take corrective action to eliminate the overexposure, and then continue to conduct verification sampling to verify the adequacy of the ventilation plan. If operators failed to take corrective actions, then they would receive a citation.

A variety of corrective actions can be taken during the verification process. Some of these are more costly than others and involve considerable effort on the part of the operator. In general, most corrective actions related to verifying a ventilation plan involve the following types of engineering controls: isolation, ventilation, dust suppression using water, operating parameters, and dust collection. For each type of engineering control, the corrective action costs vary because there is no single corrective action that fits every situation.

Table IV-40 shows examples of corrective actions (along with cost ranges) that operators could implement for non-longwall MMUs in order to verify a mine's ventilation plan.

Table IV-41 shows examples of corrective actions (along with cost ranges) that operators could implement for longwall MMUs in order to verify a mine's ventilation plan.

Table IV-40 Corrective Actions and Costs Involving Engineering Controls for Non-Longwall MMUs Verifying a Ventilation Plan	
Type of Corrective Action	**Cost Range**
Isolation **Installing a remote control device on a machine**	**$18,000 to $36,000**
Ventilation **Changing air flow** **Installing or repositioning curtains**	**$50 to $3,000**
Water/Dust Suppression **Adjusting the number and/or location of water sprays** **Adjusting type, flow, or pressure of a water spray** **Applying wetting agents** **Wetting down roadways**	**$50 to $5,000**
Dust Collection **Installing a scrubber on a machine**	**$15,000 to $35,000**
Dust Collection **Changing scrubber screen size on a machine** **Repairing or replacing dust collector on roof bolter**	**$300 to $900**

Table IV-41 Corrective Actions and Costs Involving Engineering Controls For Longwall MMUs Verifying a Ventilation Plan	
Type of Corrective Action	**Cost Range**
Isolation	
Putting passive barriers on a machine	**$500 to**
Enclosing the headgate gate on a longwall panel	**$1,000**
Ventilation	
Changing air flow	
Adjusting belt air	
Installing or repositioning curtains	
Installing gob curtains	**$300 to**
Installing a shearer-clearer system	**$10,000**
Water/ Dust Suppression	
Adjusting the number and/or location of water sprays	
Adjusting type, flow, or pressure of a water spray	
Applying wetting agents	
Wetting down roadways	**$300**
Washing down shields	**$20,000**
Operating Parameters	**$7,500 to**
Changing the cutting speed of longwall machine	**$10,000**
Dust Collection	**$4,000**
Installing a headgate dust collector	**$10,000**

Operators may employ more than one type of corrective action. MSHA assumes that the following corrective actions would be employed at non-longwall MMUs undergoing either a second or third round of verification sampling:

- 1 percent would implement isolation techniques, costing between $18,000 and $36,000 for equipment and installation (for an average of $27,000);

- 80 percent would rely on ventilation, costing between $50 and $3,000 for equipment and installation (for an average of $1,525);

- 100 percent would employ water/dust suppression techniques, costing between $50 and $5,000 for equipment and installation (for an average of $2,525);

- 1 percent would install a dust collection system (installing a scrubber on a machine), costing between $15,000 and $35,000 per machine; and

- 50 percent would utilize dust collection (changing the size of the scrubber screen size on a machine, or repairing or replacing dust collectors on a roofbolter), costing between $300 and $900 for equipment and installation (for an average of $600).

On average, corrective actions costs for a non-longwall MMU is estimated to be $4,565 = (0.01 x $27,000) + (0.8 x $1,525) + (1 x $2,525) + (0.01 x $25,000) + (0.5 x $600). These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original equipment and installation costs.[41]

MSHA assumes that the following corrective actions would be employed at longwall MMUs undergoing a second or third round of verification sampling:

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[41] The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C)/(1 + 0.07)^{i}$$

where C is the cost of installing the corrective action, 0.07 is the discount rate, and i represents the n^{th} year after the rule takes effect. This equation for S can be simplified to equal (0.25 x C/0.07).

- 15 percent would implement isolation techniques, costing between $300 and $1,000 for equipment and installation (for an average of $650);

- 100 percent would rely on ventilation, costing between $300 and $10,000 for equipment and installation (for an average of $5,150);

- 100 percent would employ water/dust suppression techniques, costing between $300 and $20,000 for equipment and installation (for an average of $10,150);

- 10 percent would modify operating parameters, costing between $7,500 and $12,500 for equipment and installation (for an average of $10,000); and

- 10 percent would install a dust collection system, costing between $4,000 and $10,000 for equipment and installation (for an average of $7,000).

On average, corrective action costs for a longwall MMU is estimated to be $17,098 = (0.15 x $650) + (1 x $5,150) + (1 x $10,150) + (0.10 x $10,000) + (0.10 x $7,000). These corrective actions would also generate an associated stream of annual OM&R costs, where these costs each year would be equal to approximately 25 percent of the original installation costs.

The types of corrective actions noted above, as well as the percentage of MMUs at which they would be employed, were provided by the Agency's technical staff in MSHA's Office of Coal Mine Safety and Health. The estimates are based on the technical staff's: (1) knowledge of the engineering controls that are currently available and used in underground coal mines, (2) experience with the effectiveness of those controls; (3) experience with the procedures currently used to abate non-compliance conditions; and (4) experience with compliance and non-compliance rates in the underground coal mining sector. Furthermore, as noted earlier, the corrective action cost estimates being applied to an MMU do not differ by mine size.[42]

When deriving operator compliance costs for corrective actions that were associated with the SS rule, it was noted that a commenter to the July 7, 2000 proposed PV rule asserted that the Agency had underestimated the potential costs to operators for new engineering controls. The commenter stated that the PREA associated with the July 7, 2000 proposed PV rule did not contain corrective action costs related to significant expenditures involving the installation of new ventilation structures, shafts, or larger fans and motors.

[42] See the earlier discussion concerning the derivation of compliance costs for corrective actions that are associated with additional SS citations.

The corrective action costs in this PREA related to the verification process average $4,565 for non-longwall MMUs and $17,098 for longwall MMUs. Although these are not small costs, the commenter is correct that they are not comparable in magnitude to the estimated expenditures noted above (e.g., $5 to $10 million, or $5,000 a foot to install a new shaft lined with concrete). However, as noted earlier, expenditures of such magnitude would not occur as a result of the promulgation of the proposed PV rule because MSHA's existing regulation (§75.370(a)(1)) requires the operator to have a mine ventilation plan suitable to control respirable dust under the conditions at the mine.

Table IV-42 shows, by size category, underground coal operators' first year costs to take corrective actions related to the first, second, and third rounds of original verification sampling.

Table IV-43 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for corrective actions taken by operators that are associated with the verification process each year after the first year. MSHA assumes that, before verification occurs for these MMUs, operators would need to take corrective actions similar in type to those detailed above. However, in many cases, the corrective actions required after the first year would merely serve to augment the initial corrective actions taken. MSHA assumes that the costs of these corrective actions per MMU involved in annual verification of ventilation plans is equal to approximately 30 percent of the corrective action costs derived above for non-longwall and longwall MMUs. The 30-percent estimate would apply to both the costs of installing the corrective actions after the first year and the associated stream of OM&R costs.

Table IV-42: Proposed 70.214
First Year Costs to Take Corrective Actions Related to Verification Sampling *

Ug. Coal Size Category	MMUs[a]	MMUs[b]	Correct-ive Action Costs Per MMU[c]	Corrective Action Costs Before 2nd Round at Verification Sampling	Corrective Action Costs Before 3rd Round at Verification Sampling	First Year Costs	Annual Costs [d]	Adjusted First Year Costs [e]	Adjusted First Year Costs Annual-ized [f]
<20 emp.	50.0	4.0	$20,869	$1,043,429	$83,474	$1,126,903	$187,817	$939,086	$65,736
20to500 emp. no lgwl	140.0	15.0	$20,869	$2,921,600	$313,029	$3,234,629	$525,888	$2,708,741	$189,612
20 to 500 emp. lgwl	27.7	22.0	$78,160	$2,166,595	$1,719,520	$3,886,115	$147,722	$3,738,393	$261,687
Sub-total				$5,088,195	$2,032,549	$7,120,744	$673,610	$6,447,133	$451,299
>500 emp. no lgwl	5.8	0.4	$20,869	$119,994	$8,400	$128,394	$21,599	$106,795	$7,476
>500 emp. lgwl	4.8	4.0	$78,160	$375,168	$312,640	$687,808	$28,138	$659,670	$46,177
Sub-total				$495,162	$321,040	$816,202	$49,737	$766,465	$53,653
Total Costs				$6,626,786	$2,437,062	$9,063,849	$911,164	$8,152,684	$570,688

[*] Note that these "first year" costs include the discounted present value of a stream of annual costs associated with the first year installation costs.

[a] Source: Table IV-21, for MMUs that failed 1st round of verification sampling and require a second round of verification sampling.

[b] Source: Table IV-21, for MMUs that failed 1st and 2nd rounds of verification sampling and require a third round of verification sampling.

[c] For non-longwall MMUs $20,869 = first year cost of Y, where Y = P + ((0.25 x P)/0.07). P = average cost of first year corrective action $4,565 = (0.01 x $27,000) + (0.8 x $1,525) + (1 x $2,525) + (0.01 x $25,000) + (0.5 x $600); where (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

For longwall MMUs $78,160 = first year cost of Y, where Y = P + (0.25 x P)/0.07. P = average cost of first year corrective action $17,098 = (0.15 x $650) + (1 x $5,150) + (1 x $10,150) + (0.10 x $10,000) + (0.10 x $7,000); where (0.25 x P)/0.07 = discounted present value of a stream of annual OM&R costs.

[d] An amount equivalent to annual costs from Table IV-43.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-43: Proposed 70.214
Annual Costs for Corrective Actions
Related to Verification Sampling

Ug. Coal Size Category	MMUs [a]	Corrective Action Costs Per MMU [b]	Annual Corrective Action Costs
<20 emp.	30	$6,261	$187,817
20 to 500 emp. no lgwl	84	$6,261	$525,888
20 to 500 emp. lgwl	6	$23,448	$147,722
Sub-total			$673,610
>500 emp. no lgwl	3	$6,261	$21,599
>500 emp. lgwl	1	$23,448	$28,138
Sub-total			$49,737
Total Annual Costs			$911,164

[a] Source: Table IV-22.

[b] Corrective action costs per MMU from Table IV-42 x 0.30.

MSHA's Estimate of the Number of Shifts Required for Verification Sampling

It is necessary to determine how many shifts it will take to conduct plan verification sampling because a control filter must be used for each shift on which verification sampling occurs. The number of shifts sampled during each round of original operator verification sampling is estimated below in order to determine costs associated with using control filters for miners to observe verification sampling.

First Year PV Rule is in Effect

During the first round of verification sampling, not all operators would be able to obtain valid verification samples after sampling their first shift. During the first round of verification sampling, some MMUs would be sampled on more than one shift in order to obtain valid samples.

For all MMUs (both non-longwall and longwall MMUs) involved in the first round of original verification sampling, MSHA estimates that operators would obtain valid verification samples for an MMU based on sampling anywhere from 1 to 5 shifts. For the first round of verification sampling, the average number of shifts per MMU (regardless of mine size) that needs to be sampled in order to get valid verification samples is estimated to be 1.49 shifts = (67% MMUs x 1 shift) + (22% MMUs x 2 shifts) + (7% MMUs x 3 shifts) + (3% MMUs x 4 shifts) + (1% MMUs x 5 shifts).[43]

As noted earlier, MSHA further expects that, even after all MMUs obtain valid samples after their first round of verification sampling, some of the sample results from the first round of verification sampling may not meet the critical values. Therefore, for these MMUs, a second round of verification sampling would be required to obtain valid samples whose results are meet the applicable critical values in the proposed PV rule. MSHA assumes that for MMUs sampled during a second round of verification sampling, one shift would be sufficient to obtain valid samples. Still, some of the MMUs involved in a second round of verification sampling would obtain valid sample results that would not meet the applicable critical values. These MMUs would require a third round of verification sampling. For MMUs undertaking a third round of verification sampling, MSHA assumes that one shift would be sufficient to obtain valid verification samples. In addition, MSHA assumes that all valid samples taken during the third round of verification sampling would meet the applicable critical values. The following example is provided below to help clarify the process:

[43] The percentages of MMUs that can obtain a valid verification sample between 1 to 5 shifts were obtained from technical staff of MSHA's Office of Coal Mine Safety and Health who have held discussions with MSHA's field staff. These percentages are based on the assumption that two thirds of the MMUs in any shift during the first round would obtain a valid verification sample.

Suppose that an MMU, undergoing the first round of verification sampling, was sampled on 4 shifts (the first 3 shifts did not produce valid samples in that they did not meet the verification production level (VPL), but the 4th shift did). MSHA analyzed the sample results from the 4th shift and found that they did not meet the critical values of 2.0 mg/m^3 of respirable dust and/or 100 Fg/m^3 of quartz. Therefore, a second round of verification sampling would be required. When a second round of verification sampling is conducted, MSHA assumes that valid samples would be obtained during the first shift. If the valid sample results from the second round of verification sampling failed to meet the critical values, the MMU would then undergo a third round of verification sampling. In the third round of verification sampling, MSHA assumes that the MMU would meet the applicable critical values on the first shift sampled.

Subsequent Years Proposed PV Rule is in Effect

After the first year, verification of ventilation plans could be required if an MSHA sample result showed non-compliance or if mining conditions changed significantly. In addition, verification of plan parameters would occur for new MMUs. MSHA assumes that in subsequent years, after the first year of the rule, on average, 15 percent of MMUs in each size category presented in Table IV-21 listed by the heading "1st Round" would need to verify ventilation plans. This 15-percent annual rate was estimated by the technical staff in MSHA's Office of Coal Mine Safety and Health. In addition, after the first year following implementation of the PV rule, MSHA estimates that for annual verification of ventilation plans the affected MMU would be sampled 1.49 shifts, on average, to obtain valid samples that meet the critical values.

Proposed §70.201(d)
Cost of Control Filters for Plan Verification Sampling

One control filter would be used for each shift sampled. The derivation of the number of shifts needed to conduct plan verification sampling is shown above. These shift figures are used in the tables below to determine operators' costs associated with the use of control filters. The cost of a filter is $13.81.

Table IV-44 shows, by size category, underground coal operators' first year costs for control filters for the first, second, and third rounds of plan verification sampling.

Table IV-45 shows, by size category, underground coal operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for control filters.

Table IV-44: Proposed 70.201(d)
First Year Costs for Control Filters for Plan Ventilation Sampling

Ug. Coal Size Category	No. of MMUs in 1st Round [a]	No. of MMUs in 2nd Round [a]	No. of MMUs in 3rd Round [a]	Cost of Control Filter	Cost of Control Filter for 1st Round [b]	Cost of Control Filter for 2nd Round [c]	Cost of Control Filter for 3rd Round [d]	First Year Costs	Annual Costs [e]	Adjusted First Year Costs [f]	Adjusted First Year Costs Annual-ized [g]
<20 emp.	200	50.0	4.0	$13.81	$4,115	$691	$55	$4,861	$617	$4,244	$297
20 to 500 emp. no lgwl	560	140.0	15.0	$13.81	$11,523	$1,933	$207	$13,664	$1,728	$11,935	$835
20 to 500 emp. lgwl	42	27.7	22.0	$13.81	$864	$383	$304	$1,551	$130	$1,421	$99
Sub-total	602	167.7	37.0		$12,387	$2,316	$511	$15,214	$1,858	$13,356	$935
>500 emp. no lgwl	23	5.8	0.4	$13.81	$473	$79	$6	$558	$71	$487	$34
>500 emp. lgwl	8	4.8	4.0	$13.81	$165	$66	$55	$286	$25	$261	$18
Sub-total	31	10.6	4.4		$638	$146	$61	$844	$96	$749	$52
Total Costs					$17,141	$3,152	$627	$20,920	$2,571	$18,349	$1,284

[a] **Source: Table IV-21.**

[b] **No. of MMUs in 1st round (x) cost of control filter (x) 1.49 shifts.**

[c] **No. of MMUs in 2nd round (x) cost of control filter (x) 1 shift.**

[d] **No. of MMUs in 3rd round (x) cost of control filter (x) 1 shift.**

[e] **An amount equivalent to annual costs from Table IV-45.**

[f] **Adjusted first year costs equal first year costs minus first year of annual costs.**

[g] **Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.**

Table IV-45: Section 70.201(d)
Annual Costs for Control Filters for Plan Verification Sampling

Ug. Coal Size Category	No. of MMUs [a]	Cost of Control Filter [b]	No. of Shifts Observed Per MMU	Annual Costs to Observe Sampling
<20 emp.	30	$13.81	1.49	$617
20 to 500 emp. no-lgwl	84	$13.81	1.49	$1,728
20 to 500 emp. lgwl	6	$13.81	1.49	$130
Sub-total	90			$1,858
>500 emp. no-lgwl	3	$13.81	1.49	$71
>500 emp. lgwl	1	$13.81	1.49	$25
Sub-total	5			$96
Total Annual Costs				$2,571

[a] Source: Table IV-22.

[b] Cost to observe sampling from Table IV-44.

Use of PAPRs and Administrative Controls

Under the proposed PV rule, MSHA anticipates that some mine operators would be permitted to use PAPRs or administrative controls in order to meet the applicable critical values. Also, once a ventilation plan has been verified, if special conditions arise which directly impact the ability of the previously verified plan parameters to effectively control respirable dust, the proposed PV rule provides for the use of PAPRs to protect individual miners from excessive dust concentrations under such special circumstances. In this latter case, PAPR use would be limited to 30 days.[44]

Table IV-46 shows, by size category, MSHA's estimate of the number of MMUs that would require the use of PAPRs or administrative controls to verify mine ventilation plans. Five percent, in each size category, of the remaining MMUs not expected to use PAPRs or administrative controls for purposes of verifying a ventilation plan are anticipated to employ PAPRs under special circumstances. Table IV-46 also shows, by size category, the estimated number of MMUs at which miners are anticipated to use PAPRs when encountering special conditions while mining. The estimates in Table IV-46 were provided by MSHA's Office of Coal Mine Safety and Health.

Table IV-46:
Number of MMUs Using Either PAPRs or Administrative Controls
by Size Category

Supplementary Controls	MMUs				
		20 to 500 emp.		>500 emp.	
	<20 emp.	No Lgwl	Lgwl	No Lgwl	Lgwl
Total MMUs [a]	200	560	42	23	8
Using Supplementary Controls for Plan Verification					
PAPRs	1	5	17	0	4
Administrative Controls	3	10	5	0	0
Sub-total	4	15	22	0	4
Using PAPRs for Special Circumstances					
PAPRs [b]	10	27	1	1	0

[a] Source: Table IV-21.

[b] (Total MMUs - Sub-total) x 0.05

Proposed §70.209(a) and §70.212(c)(1)

[44] If PAPR use is to exceed 30 consecutive days or if any equivalent concentration measurements indicate that miners are being overexposed, the operator must revise and verify the adequacy of the plan parameters under the prevailing operating conditions.

Cost to Write Request for Permission to Use Supplementary Controls and Send it to MSHA and to the Miners' Representative

Under proposed §70.209(a), if mine operators cannot verify the ventilation plan with dust control parameters sufficient to maintain dust concentrations below the verification limits, the operator can request, in writing, authority to use supplementary control measures (PAPRs, administrative controls, or both) to assist in meeting the applicable critical values. This request must be sent to MSHA's Administrator for Coal Mine Safety and Health. A copy of the request must be sent to the miners' representative. In addition, under §70.212(c)(1), if mine operators with verified plan parameters encounter special mining conditions which would require the use of PAPRs for a limited time period, they must request permission from MSHA to use PAPRs. This request must be sent to MSHA and the miners' representative.

MSHA estimates that it would take a supervisor 1 hour to prepare a 2-page request for permission to use supplementary controls (either PAPRs or administrative controls). A clerical worker is estimated to spend 0.35 hours typing, making copies, and sending the request to MSHA and the miners' representative. Photocopying costs are estimated to be $0.15 per page. Postage is estimated to be $1. As previously discussed, Table IV-46 shows the estimated number of MMUs for which operators would request the use of supplementary controls during verification sampling and PAPRs when encountering special mining conditions.

Table IV-47 shows, by size category, underground coal operators' first year costs to write a request to use PAPRs or administrative controls when verifying a ventilation plan. The first year costs were annualized using an annualization factor of 0.142, which reflects a 10-year life of the written plan and an annual discount rate of 7 percent.

Table IV-48 shows, by size category, underground coal operators' annual costs to write a request to use PAPRs for special mining conditions. MSHA estimates that such special conditions would occur three times per year, on average.

Table IV-47: Proposed 70.209(a)
First Year Costs for Requesting Permission to Use
Supplementary Controls for Plan Verification

Ug. Coal Size Category	No. of MMUs Using PAPRs or Adm. Controls [a]	Cost to Prepare Request [b]	First Year Costs	First Year Costs Annualized [c]
<20 emp.	4	$64.37	$257	$37
20 to 500 emp. no-lgwl	15	$64.37	$966	$137
20 to 500 emp. lgwl	22	$64.37	$1,416	$201
Sub-total	37		$2,382	$338
>500 emp. no-lgwl	0	$64.37	$0	$0
>500 emp. lgwl	4	$64.37	$257	$37
Sub-total	4		$257	$37
Total Costs			$2,897	$411

[a] Source: Table IV-46.

[b] $64.37 = (1 hr. x $54.92) + (0.35 hrs. x $19.58) + (((($0.15 x 2) +$1) x 2), where 1 hour is the supervisor time to write the request, $54.92 is the supervisor's hourly wage, 0.35 hours is the clerical worker's time to type and copy, $19.58 is the clerical worker's hourly wage, $0.15 is photocopy costs per page, $1 is postage costs, and 2 is for two copies to be mailed.

[c] First year costs are multiplied by an annualization factor of 0.142.

Table IV-48: Proposed 70.212(c)(1)
Annual Costs for Requesting Permission to Use
PAPRs for Special Mining Conditions

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Cost to Prepare PAPR Request [b]	No. of Requests to Prepare Per Year	Annual Costs
<20 emp.	10	$64.37	3	$1,931
20 to 500 emp. no-lgwl	27	$64.37	3	$5,214
20 to 500 emp. lgwl	1	$64.37	3	$193
Sub-total	28			$5,407
>500 emp. no-lgwl	1	$64.37	3	$193
>500 emp. lgwl	0	$64.37	3	$0
Sub-total	1			$193
Total Costs				$7,532

[a] Source: Table IV-46.

[b] Cost to prepare PAPR request from Table IV-47.

Proposed §70.217(b)(3)
Cost for Operator to Post Written Request for Permission to PAPRs or Administrative Controls

The operator must post the written request to use PAPRs or administrative controls. The number of MMUs that are anticipated to use PAPRs or administrative controls is shown in Table IV-46. MSHA estimates that, on average, it will take a clerical person 0.1 hours to copy and post the written requests for permission to use supplementary controls. Photocopy costs are $0.15 per page.

Table IV-49 shows, by size category, underground coal operators' first year and annualized costs to post written requests to use supplementary controls when verifying a mine ventilation plan. The first year costs were annualized using an annualization factor of 0.142, which reflect a 10-year life of the written plan and an annual discount rate of 7 percent.

Table IV-50 shows, by size category, underground coal operators' annual costs to post written requests to use PAPRs when encountering special mining conditions.

Table IV-49: Proposed 70.209(a) and 70.217(b)(2)
First Year Costs to Post Written Permission
to Use Supplementary Controls for Plan Verification

Ug. Coal Size Category	No. of MMUs Using PAPRs or Adm. Controls [a]	Cost to Copy & Post Request [b]	First Year Costs	First Year Costs Annualized [c]
<20 emp.	4	$2.26	$9	$1
20 to 500 emp. no-lgwl	15	$2.26	$34	$5
20 to 500 emp. lgwl	22	$2.26	$50	$7
Sub-total	37		$84	$12
>500 emp. no-lgwl	0	$2.26	$0	$0
>500 emp. lgwl	4	$2.26	$9	$1
Sub-total	4		$9	$1
Total Costs			$102	$14

[a] Source: Table IV-46.

[b] $2.26 = (0.1 hrs. x $19.58) + ($0.15 x 2), where 0.1 hours is the clerical worker's time to copy and post the request, $19.58 is the clerical worker's hourly wage, $0.15 is photocopy costs per page, and 2 is for two pages to be copied.

[c] First year costs are multiplied by an annualization factor of 0.142.

Table IV-50: Proposed 70.212(c)(1) and 70.217(b)(3)
Annual Costs to Post Written Permission to Use
PAPRs for Special Mining Conditions

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Cost to Copy & Post Request [b]	No, of Times to Post Per Year	Annual Costs
<20 emp.	10	$2.26	3	$68
20 to 500 emp. no-lgwl	27	$2.26	3	$183
20 to 500 emp. lgwl	1	$2.26	3	$7
Sub-total	28			$190
>500 emp. no-lgwl	1	$2.26	3	$7
>500 emp. lgwl	0	$2.26	3	$0
Sub-total	1			$7
Total Costs				$264

[a] Source: Table IV-46.

[b] Cost to copy and post request from Table IV-49.

Sections 70.210(a) and 70.213(a)
Cost to Write a PAPRs or Administrative Control Program

Section 70.210(a) and Section 70.213(a) require the preparation and submission to the District Manager of a written PAPR program and a written administrative control program, respectively.

The number of MMUs that are anticipated to use PAPRs or administrative controls is shown in Table IV-46. MSHA estimates that, on average, it would take a supervisor 4 hours to write a PAPR program and 2 hours to write an administrative control program. In addition, a clerical worker is estimated to take 30 minutes (0.5 hours) to type the program. The PAPR program or administrative control program is estimated to be no longer than 5 pages. The PAPR program would be incorporated into the mine ventilation plan. There are no costs derived here for sending the written PAPR program to MSHA, because such costs were already accounted for in the costs estimated to send in revised mine ventilation plans.

Table IV-51 shows, by size category, underground coal operators' first year and annualized costs to write a PAPR or administrative control program. On average, MSHA expects that the PAPR or administrative control program would change approximately every 2 years. Therefore, first year costs were annualized using an annualization factor of 0.553, which reflects an investment period of 2 years and an annual discount rate of 7 percent.

Table IV-51: Proposed 70.210(a) and 70.213(a)
First Year Costs to Write a PAPR or Administrative Control Program

(a)	(b)	(c)	(d)	(e)	(f)	(g)
Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of MMUs Using Adm. Controls [a]	Cost to Write PAPR Program [b]	Cost to Write Adm. Controls Program [c]	First Year Costs [d]	First Year Costs Annualized [e]
<20 emp.	11	3	$229.47	$119.63	$2,883	$1,594
20 to 500 emp. no-lgwl	32	10	$229.47	$119.63	$8,539	$4,722
20 to 500 emp. lgwl	18	5	$229.47	$119.63	$4,729	$2,615
Sub-total	50	15			$13,268	$7,337
>500 emp. no-lgwl	1	0	$229.47	$119.63	$229	$127
>500 emp. lgwl	4	0	$229.47	$119.63	$918	$508
Sub-total	5	0			$1,147	$634
Total Costs					$17,298	$9,566

[a] Source: Table IV-46.

[b] Cost to write a PAPR program = (4 x $54.92) + (0.5 x $19.58), where 4 hours is the supervisor's time to write the program, $54.92 is the supervisor's hourly wage, 0.5 hours is the clerical worker's time to type the program, and $19.58 is the clerical worker's hourly wage.

[c] Cost to write an administrative controls program = (2 x $54.92) + (0.5 x $19.58), where 2 hours is the supervisor's time to write the program, $54.92 is the supervisor's hourly wage, 0.5 hours is the clerical worker's time to type the program, and $19.58 is the clerical worker's hourly wage.

[d] First year costs = (col. b x col. d) + (col. c x col. e).

[e] First year costs are multiplied by an annualization factor of 0.553.

Sections 70.210(a)(3)
Cost to Post Warning Signs at MMUs Where PAPRs are Used

Operators must post warning signs with the statement "Respiratory Protection Required in this Area" in locations where PAPRs are required to be worn by miners.

Table IV-46 shows the estimated number of MMUs where PAPRs would be used. Generally, longwall MMUs have a single point of entry through which every miner must pass, while non-longwalls may have multiple entry points at which work is being conducted. Therefore, MSHA estimates that 1 warning sign would be posted on longwall MMUs where PAPRs are worn, while 2 warning signs would be posted on non-longwalls where PAPRs are being used. MSHA estimates that, on average, it would take a miner 12 minutes (0.2 hours) to post 1 sign and 24 minutes (0.4 hours) to post two signs. MSHA estimates that each sign would cost $10.

Table IV-52 shows, by size category, underground coal operators' first year costs to post warning signs in areas where PAPRs are worn by miners. On average, MSHA expects that signs will last for two years. Therefore, first year costs were annualized using an annualization factor of 0.553, which reflects an investment period of 2 years and an annual discount rate of 7 percent.

Table IV-52: Proposed 70.210(a)(3)
First Year Costs to Post Warning Signs Where PAPRs are Used

Ug. Coal Size Category	No. of MMUs Using PAPRs That Require Signs to Posted [a]	No. of Signs to Post Per MMU	Cost to Post Warning Signs Per MMU [b]	First Year Costs	First Year Costs Annualized [c]
<20 emp.	11	2	$31.23	$687	$380
20 to 500 emp. no-lgwl	32	2	$31.23	$1,999	$1,105
20 to 500 emp. lgwl	18	1	$15.61	$281	$155
Sub-total	50			$2,280	$1,261
>500 emp. no-lgwl	1	2	$31.23	$62	$35
>500 emp. lgwl	4	1	$15.61	$62	$35
Sub-total	5			$125	$69
Total Costs				$3,092	$1,710

[a] Source: Table IV-46.

[b] $31.23 = (0.4 hrs. x $28.07) + $20, where 0.4 hours is the time to post two warning signs, $28.07 is a miner's hourly wage, and $20 is the cost of two signs.
$15.61 = (0.2 hrs. x $28.07) + $10, where 0.2 hours is the time to post one warning sign, $28.07 is a miner's hourly wage, and $10 is the cost of a sign.

[c] First year costs are multiplied by an annualization factor of 0.553.

Proposed §70.213
Costs of Implementing Administrative Controls

In order for operators to implement administrative controls, they would need to rotate miners among different longwall work positions. Table IV-46 shows MSHA's estimate that there are 13 non-longwall MMUs and 5 longwall MMUs that would use administrative controls. On average, MSHA estimates that 3 work positions would be rotated for each MMU using administrative controls. MSHA estimates that it would take about 0.02 hours (1.2 minutes) for workers, earning $26.83 per hour, to rotate positions. Rotation is estimated to occur every 4 hours on each 8 hour shift.

MSHA assumed that, on average, the number of rotations per year for three workers would be:

- 780 at MMUs employing fewer than 20 workers (5 work days/week, 52 work weeks/year, 1 shift/day, and 3 workers);
- 1,560 at non-longwall MMUs employing 20 to 500 workers (5 work days/week, 52 work weeks/year, 2 shifts/day, and 3 workers);
- 1,872 at longwall MMUs employing 20 to 500 workers (6 work days/week, 52 work weeks/year, 2 shifts/day, and 3 workers);
- 2,340 at non-longwall MMUs employing more than 500 workers (5 work days/week, 52 work weeks/year, 3 shifts/day, and 3 workers); and
- 2,808 at longwall MMUs employing more than 500 workers (6 work days/week, 52 work weeks/year, 3 shifts/day, and 3 workers).

Table IV-53 shows, by size category, underground coal operators' annual costs for MMUs that are using administrative controls.

Table IV-53: 70.213
Annual Costs to Rotate Workers for Longwall Operators
That Use Administrative Controls

Ug. Coal Size Category	No. of MMUs Using Adm. Controls [a]	Cost to Rotate a Worker (per MMU) [b]	No. of Rotations (per Yr.)	Annual Costs
<20 emp.	3	$0.56	780	$1,314
20 to 500 emp. no lgwl	10	$0.56	1,560	$8,758
20 to 500 emp. lgwl	5	$0.56	1,872	$5,255
Sub-total	15			$14,013
>500 emp. no lgwl	0	$0.56	2,340	$0
>500 emp. lgwl	0	$0.56	2,808	$0
Sub-total	0			$0
Total Annual Costs				$15,326

[a] Source: Table IV-46.

[b] $0.56 = (0.02 x $28.07), where 0.02 is the number of hours for each miner to rotate to a new position, and $28.07 is the miner's hourly wage.

Proposed §70.210(a)(2)
Annual Costs for Supervisor to Prepare for PAPR Training for Miners

Section 70.210(a)(2) states that the use of PAPRs should comply with existing § 72.710 (Selection, fit, use, and maintenance of approval respirators). Existing §72.710 states that respirators should be used and maintained in accordance with the American National Standards Institute's (ANSI) "Practices for Respiratory Protection ANSI Z88.2-1969." In order to follow the ANSI standard, workers must be trained in the use of PAPRs as part of an overall program. Before training occurs, the operator would incur costs to prepare a training program.

MSHA assumes that a mine supervisor would give the PAPR training, and estimates that it would take approximately 2 hours to prepare the training program. The number of MMUs using PAPRs is shown in Table IV-46. Although the training would be given annually by the supervisor to miners, development of the training program is a one-time cost because it can be used in future years with minimal changes. The first year costs for the supervisor to prepare for PAPR training has been annualized using an annualization factor of 7 percent.

Table IV-54 shows first year and annualized costs for underground coal operators to prepare for training miners in the use of PAPRs.

Table IV-54: Section 70.210(a)(2)
First Year and Annualized Costs for Supervisor to Prepare for Training Miners in the use of PAPRs

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Cost of Superv. to Prepare (per MMU) [b]	First Year Costs	Annualized Costs [c]
<20 emp.	11	$109.84	$1,208	$85
20 to 500 emp. no lgwl	32	$109.84	$3,515	$246
20 to 500 emp. lgwl	18	$109.84	$1,977	$138
Sub-total	50		$5,492	$384
>500 emp. no lgwl	1	$109.84	$110	$8
>500 emp. lgwl	4	$109.84	$439	$31
Sub-total	5		$549	$38
Total Costs			$7,249	$507

[a] Source: Table IV-46.

[b] $109.84 = (2 x $54.92), where 2 is the hours needed to prepare, and $54.92 is a supervisor's hourly wage.

[c] First year costs annualized = first year costs x 0.07, where 0.07 is the annualization factor.

Proposed §70.210(a)(2)
Annual Costs to Give PAPR Training to Existing Miners

The PAPR training would be given annually. During classroom training miners would be provided with a copy of the manufacturer's instructions concerning the use, care, maintenance, and storage of a PAPR. In addition, miners would each have hands-on training in order to demonstrate their understanding of the topics covered in the classroom training.

On average, MSHA estimates that classroom training would take 0.25 hours (15 minutes) and hands-on training would take an additional 0.25 hours (15 minutes). A mine supervisor would give both the classroom and hands-on training. On average, MSHA estimates that the instruction manual would be 26 pages long. For each miner trained, a clerical worker would take 0.05 hours (3 minutes) to copy 26 pages at cost of $0.15 per page.

MSHA assumes that, on each MMU production shift, five miners would need PAPR training. All five miners are not expected to wear a PAPR at the same time; however, training is needed by all five miners due to job changes and absenteeism. Miners would be trained on their shift. On average, MSHA assumes that: MMUs at mines employing fewer than 20 workers work one shift per day; MMUs at mines employing 20 to 500 workers work two shifts per day; and MMUs at mines employing more than 500 workers work three shifts per day. Therefore, MMUs at mines employing fewer than 20 workers would have one training session, MMUs at mines employing 20 to 500 workers would have two training sessions, and MMUs at mines employing more than 500 workers would have three training sessions.

Table IV-55 shows, by size category, underground coal operators' annual costs to train existing miners in the use of PAPRs.

Table IV-55: Section 70.210(a)(2)
Annual Costs to Give PAPR Training to Existing Miners

(a)	(b)	(c)	(d)	(e)	(f)	(g)
Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of Training Sessions Per MMU	No. of Miners to Train Per Session	Cost of Classroom Training Per Session [b]	Cost for Hands-on Training Per Miner [c]	Annual Costs [d]
<20 emp.	11	1	5	$73.21	$20.75	$1,946
20 to 500 emp. no lgwl	32	2	5	$73.21	$20.75	$11,325
20 to 500 emp. lgwl	18	2	5	$73.21	$20.75	$6,370
Sub-total	50					$17,695
>500 emp. no lgwl	1	3	5	$73.21	$20.75	$531
>500 emp. lgwl	4	3	5	$73.21	$20.75	$2,123
Sub-total	5					$2,654
Total Costs						$22,296

[a] Source: Table IV-46.

[b] $73.21 per session costs = (0.25 x ((5 x $28.07) +(1 x $54.92))) + (0.05 x 5 x $19.58) + ($0.15 x 26 x 5), where 0.25 hrs. is the classroom training time, 5 is the number of miners to be trained per session, $28.07 is the miner's hourly wage, 1 is the number of supervisors to give training, $54.92 is the supervisor's hourly wage, 0.05 is the clerical worker's time to make a copy of training materials for 1 miner, 5 is the number of miners trained per session, $19.58 is the clerical worker's hourly wage, $0.15 is copy cost per page, 26 are the number of pages to copy, and 5 is the number of miners that need copies per session.

[c] $20.75 = 0.25 x ($28.07 + $54.92), where 0.25 is the hands on training time per miner, $28.07 is the miner's hourly wage rate, and $54.92 is the supervisor's hourly wage rate.

[d] Annual costs = (col. b x col. c x col. e) + (col. b x col. c x col. d x col. f).

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Proposed §70.210(a)(2)
Annual Costs to Train New Miners in the Use of PAPRs

As a result of miner turnover, PAPR training will have to be given to new miners. Assuming an annual miner turnover rate of 7 percent for each affected MMU, approximately 1 new miner per MMU would need PAPR training. The same PAPR training assumptions detailed above for existing miners also apply to new miners with the one exception that the new miners will all be trained individually.

Table IV-56 shows, by size category, underground coal operators' annual costs to train new miners in the use of PAPRs.

Table IV-56: Section 70.210(a)(2)
Annual Costs to Give PAPR Training to New Miners

(a)	(b)	(c)	(d)	(e)	(f)	(g)
Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of Training Sessions Per MMU	No. of Miners to Train Per Session	Cost of Classroom Training Per Session [b]	Cost for Hands-on Training Per Miner [c]	Annual Costs [d]
<20 emp.	11	1	1	$25.63	$20.75	$510
20 to 500 emp. no lgwl	32	1	1	$25.63	$20.75	$1,484
20 to 500 emp. lgwl	18	1	1	$25.63	$20.75	$835
Sub-total	50					$2,319
>500 emp. no lgwl	1	1	1	$25.63	$20.75	$46
>500 emp. lgwl	4	1	1	$25.63	$20.75	$185
Sub-total	5					$232
Total Costs						$3,061

[a] Source: Table IV-46.

[b] $25.63 per session costs = (0.25 x ((1 x $28.07) +(1 x $54.92))) + (0.05 x 1 x $19.58) + ($0.15 x 26 x 1), where 0.25 hrs. is the classroom training time, 1 is the number of miners to be trained per session, $28.07 is the miner's hourly wage, 1 is the number of supervisors to give training, $54.92 is the supervisor's hourly wage, 0.05 is the clerical worker's time to make a copy of training materials for 1 miner, 1 is the number of miners trained per session, $19.58 is the clerical worker's hourly wage, $0.15 is copy cost per page, 26 are the number of pages to copy, and 1 is the number of miners that need copies per session.

[c] $20.75 = 0.25 x ($28.07 + $54.92), where 0.25 is the hands-on training time per miner, $28.07 is the miner's hourly wage rate, and $54.92 is the supervisor's hourly wage rate.

[d] Annual costs = (col. b x col. c x col. e) + (col. b x col. c x col. d x col. f).

Proposed §70.210(a)(2)
Burden Hours and Costs to Make a Record of PAPR Training Given to Miners

After annual PAPR training has been given, the supervisor will make a record of the training. This record will serve as proof that such training was provided. MSHA estimates that, for each miner receiving PAPR training, it would take a mine supervisor 1.5 minutes (0.025 hours) to make a record of such training. Six miners (5 existing and 1 new miner) per non-longwall MMUs at mines employing fewer than 20 workers would need training. For mines employing 20 to 500 workers, 11 miners (10 existing miners and 1 new miner) per MMU would need training. For mines employing more than 500 workers, 16 miners (15 existing miners and 1 new miner) per MMU would need training.

Table IV-57 shows, by size category, underground coal operators' annual costs to make a record of PAPR training given to miners.

Table IV-57: Section 70.210(a)(2)
Annual Costs to Make a Record of PAPR Training Given to Miners

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of Miners to Train Per MMU [b]	Time to Make Record Per Miner	Superv. Wage Rate	Annual Costs
<20 emp.	11	6.0	0.025	$54.92	$91
20 to 500 emp. no lgwl	32	11.0	0.025	$54.92	$483
20 to 500 emp. lgwl	18	11.0	0.025	$54.92	$272
Sub-total	50				$755
>500 emp. no lgwl	1	16.0	0.025	$54.92	$22
>500 emp. lgwl	4	16.0	0.025	$54.92	$88
Sub-total	5				$110
Total Costs					$956

[a] Source: Table IV-46.

[b] Source: Table IV-55 and Table IV-56.

Proposed §70.210(a)(2)
First Year Costs to Purchase PAPRs

Although five miners per shift would receive PAPR training, MSHA assumes that, for MMUs on which PAPRs are used, an average of three PAPRs would be worn on an MMU during a shift. The three PAPRs on the first shift are assumed to be cleaned at the end of the shift so they can be used by miners on the next alternating shift (the third shift). Miners on the second shift would use three other PAPRs, which would be cleaned at the end of the shift so they can be used by miners on the next alternating shift (the fourth shift). The cycle repeats and thus, on average, six PAPRs are estimated to be purchased for each affected MMU. A PAPR costs $816.95, and has a life of 5 years.[45] The above information was provided by MSHA's Office of Coal Mine Safety and Health.

Table IV-58 shows, by size category, underground coal operators' first year and annualized costs to purchase PAPRs. The first year costs are annualized using an annualization factor of 0.244, which reflects a 7 percent annual discount rate and the fact that this equipment has a 5 year life.

[45] The PAPR cost is for 3M Airstream Headgear-Mounted PAPR System, Model No. AS-600LBC.

Table IV-58: Section 70.210(a)(2)
First Year Costs to Purchase PAPRs

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Average No. of PAPRs Purcahsed Per MMU	Cost of One PAPR	First Year Costs	First Year Costs Annualized [b]
<20 emp.	11	6	$816.95	$53,919	$13,156
20 to 500 emp. no lgwl	32	6	$816.95	$156,854	$38,272
20 to 500 emp. lgwl	18	6	$816.95	$88,231	$21,528
Sub-total	50			$245,085	59,801
>500 emp. no lgwl	1	6	$816.95	$4,902	$1,196
>500 emp. lgwl	4	6	$816.95	$19,607	$4,784
Sub-total	5			$24,509	$5,980
Total Costs				$323,512	$78,937

[a] Source: Table IV-46.

[b] First year costs annualized = first year costs x 0.244, where 0.244 is the annualization factor.

Proposed §70.210(a)(2)
Cost to Maintain PAPRs

Maintenance must be performed on a PAPR to keep the device operating properly. For both longwall and non-longwall MMUs , the following equipment, costing $332.52, would be needed to maintain a PAPR throughout the year:

- $209 for 1 intrinsically-safe battery pack;
- $40.60 for 1 headseal;
- $37.28 for 2 (medium/large) elastomeric faceseals costing $18.64 apiece;
- $35.64 for 1 pre-filter per month (12 months x $2.97 per pre-filter); and
- $10 for 1 visor.

In addition to the above equipment, after every shift on which a PAPR is used, a high efficiency filter (costing $26) and a protective cover that overlays the visor (costing $1) should be changed.[46] MSHA estimates that a miner, earning $28.07 per hour, would take 0.2 hours (12 minutes) to make the change. Therefore, the costs to change a high efficiency filter and protective cover would be $32.61 [($28.07 x 0.2) + $26 +$1].

Changing the high efficiency filter and the protective cover would occur every workday at MMUs that have miners using PAPRs as a result of plan verification. For one PAPR, high efficiency filter and protective cover changes would occur:

- 260 times at MMUs employing fewer than 20 workers (1 shift/day x 5 work days/week x 52 weeks/year);
- 520 times at non-longwall MMUs employing 20 to 500 workers (2 shifts/day x 5 work days/week x 52 weeks/year);
- 624 times at longwall MMUs employing 20 to 500 workers (2 shifts/day x 6 work days/week x 52 weeks/year);
- 780 times at non-longwall MMUs employing more than 500 workers (3 shifts/day x 5 work days/week x 52 weeks/year); and
- 936 times at longwall MMUs employing 20 to 500 workers (3 shifts/day x 6 work days/week x 52 weeks/year).

[46] In the hearings on the proposed rule published on July 7, 2000, one commenter stated the following concerning an airstream helmet "I know myself as a coal miner, when I wore one of these as a sheer operator, I changed my filter every day at the beginning of the shift and at lunch time." Although, the experience of this miner was to use two filters during a shift, MSHA still believes that the design of current filters is sufficient, at the respirable dust concentrations permitted under the PV rule, to last one full shift.

Table IV-59 shows, by size category, underground coal operators' annual maintenance costs for PAPRs used as a result of plan verification needs.

Table IV-59: Section 70.210(a)(2)
Annual Maintenance Costs for PAPRs Used for Plan Verification Needs

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Avg. No. of PAPRs Per MMU	Avg. No. of PAPRs Per Shift	No. of Annual PAPR Changes Per MMU	Costs Related to PAPR Changes Per Shift Per MMU [b]	Annual Equipment Costs [c]	Annual Costs [d]
<20 emp.	1	6	3	260	$32.61	$332.52	$27,434
20 to 500 emp. no lgwl	5	6	3	520	$32.61	$332.52	$264,365
20 to 500 emp. lgwl	17	6	3	624	$32.61	$332.52	$1,071,825
Sub-total	22						$1,336,190
>500 emp. no lgwl	0	6	3	780	$32.61	$332.52	$0
>500 emp. lgwl	4	6	3	936	$32.61	$332.52	$374,301
Sub-total	4						$374,301
Total Costs							$1,737,925

[a] Source: Table IV-46.

[b] $32..61 = (0.2 x $28.07) + $26 + $1, where 0.2 hours is the time per shift to change the high efficiency filter and protective cover, and $28.07 is the miner's hourly wage, $26 is the cost of a high efficiency filter, and $1 is the cost of a protective cover.

[c] $332.52 = $209 for 1 intrinsically-safe battery pack, $40.60 for 1 headseal, $37.28 for 2 (medium/large elastomeric faceseals, $35.64 for 1 pre-filter per month (12 x $2.97 per pre-filter), and $10 for a visor.

[d] Annual Costs = (col. b x col. c x col. g) + (col. b x col. d x col. e x col. f).

With respect to PAPRs worn on MMUs that experience special mining conditions, the equipment costs, totaling $332.52, are assumed to be the same. The costs to change a high efficiency filter and protective cover would also be the same as determined above. However, high efficiency filter and protective cover changes would occur much less frequently.

MSHA assumes that an affected MMU would encounter special mining conditions only three times per year, and PAPRs would be worn for 45 days throughout the year (on average, 15 days per occurrence). For one PAPR, high efficiency filter and protective cover changes would occur:

- 45 times at MMUs employing fewer than 20 workers (1 shift/day x 45 work days/year);
- 90 times at non-longwall and longwall MMUs employing 20 to 500 workers (2 shifts/day x 45 work days/year); and
- 135 times at non-longwall MMUs employing more than 500 workers (3 shifts/day x 45 work days/year);

Table IV-60 shows, by size category, underground coal operators' annual maintenance costs for PAPRs used as a result of special mining conditions.

Table IV-60: Section 70.210(a)(2)
Annual Maintenance Costs for PAPRs Used for Special Mining Conditions

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Avg. No. of PAPRs Per MMU	Avg. No. of PAPRs Per Shift	No. of Annual PAPR Changes Per MMU	Costs Related to PAPR Changes Per Shift Per MMU [b]	Annual Equipment Costs [c]	Annual Costs [d]
<20 emp.	10	6	3	45	$32.61	$332.52	$63,980
20 to 500 emp. no lgwl	27	6	3	90	$32.61	$332.52	$291,624
20 to 500 emp. lgwl	1	6	3	90	$32.61	$332.52	$10,801
Sub-total	28						$302,425
>500 emp. no lgwl	1	6	3	135	$32.61	$332.52	$15,204
>500 emp. lgwl	0	6	3	135	$32.61	$332.52	$0
Sub-total	1						$15,204
Total Costs							$381,609

[a] Source: Table IV-46.

[b] $32..61 = (0.2 x $28.07) + $26 + $1, where 0.2 hours is the time per shift to change the high efficiency filter and protective cover, and $28.07 is the miner's hourly wage, $26 is the cost of a high efficiency filter, and $1 is the cost of a protective cover.

[c] $332.52 = $209 for 1 intrinsically-safe battery pack, $40.60 for 1 headseal, $37.28 for 2 (medium/large elastomeric faceseals, $35.64 for 1 pre-filter per month (12 x $2.97 per pre-filter), and $10 for a visor.

[d] Annual Costs = (col. b x col. c x col. g) + (col. b x col. d x col. e x col. f).

Proposed §70.210(a)(2)
Cost for Inspecting PAPRs Before and After Use

Before a PAPR is used, it must be inspected to ensure that it is in proper working condition. The flow rate must be checked, as well as the physical condition of the helmet. Also, after each use (at the end of a shift), the PAPR must be cleaned and disinfected. MSHA estimates that it would take a miner a total of 0.35 hours (21 minutes) per day to inspect a PAPR before use and then to clean and disinfect it after use. As noted earlier, for MMUs on which PAPRs are used, an average of 3 PAPRs are expected to be used during a shift.

With respect to PAPRs used by miners at MMUs as a result of plan verification needs, the following annual number of shift inspections is estimated to be:

- 260 at MMUs employing fewer than 20 workers (1 shift/day x 5 work days/weeks x 52 weeks/year);
- 520 at non-longwall MMUs employing 20 to 500 workers (2 shifts/day x 5 work days/week x 52 weeks/year);
- 624 at longwall MMUs employing 20 to 500 workers (2 shifts/day x 6 work days/week x 52 weeks/year);
- 780 at non-longwall MMUs employing more than 500 workers (3 shifts/day x 5 work days/week x 52 weeks/year); and
- 936 at longwall MMUs employing more than 500 workers (3 shifts/day x 6 work days/week x 52 weeks/year).

Table IV-61 shows, by size category, underground coal operators' annual costs to inspect, clean, and disinfect PAPRs that are used as a result of plan verification needs.

Table IV-61: Section 70.210(a)(2)
Annual Costs to Inspect PAPRs Used for Plan Verification Needs

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Annual No. of Shifts That PAPR Inspections Would Occur Per MMU	Avg. No. of PAPRs Worn Per Shift	Time for One PAPR Inspection (in hrs.)	Miner Wage Rate Per Hr.	Annual Costs
<20 emp.	1	260	3	0.35	$28.07	$7,663
20 to 500 emp. no lgwl	5	520	3	0.35	$28.07	$76,631
20 to 500 emp. lgwl	17	624	3	0.35	$28.07	$312,655
Sub-total	22					$389,286
>500 emp. no lgwl	0	780	3	0.35	$28.07	$0
>500 emp. lgwl	4	936	3	0.35	$28.07	$110,349
Sub-total	4					$110,349
Total						$507,298

[a] Source: Table IV-46.

With respect to PAPRs worn on MMUs that experience special mining conditions, the following annual number of shift inspections is estimated to be:

- 45 at MMUs employing fewer than 20 workers (1 shift/day x 45 days);
- 90 at non-longwall and longwall MMUs employing 20 to 500 workers (2 shifts/day x 45 days); and
- 135 at non-longwall and longwall MMUs employing more than 500 workers (3 shifts/day x 45 days).

Table IV-62 shows, by size category, underground coal operators' annual costs to inspect, clean, and disinfect PAPRs used as a result of special mining conditions.

Table IV-62: Section 70.210(a)(2)
Annual Costs to Inspect PAPRs Used for Special Mining Conditions

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	Annual No. of Shifts That PAPR Inspections Would Occur Per MMU	Avg. No. of PAPRs Worn Per Shift	Time for One PAPR Inspection (in hrs.)	Miner Wage Rate Per hr.	Annual Costs
<20 emp.	10	45	3	0.35	$28.07	$13,263
20 to 500 emp. no lgwl	27	90	3	0.35	$28.07	$71,621
20 to 500 emp. lgwl	1	90	3	0.35	$28.07	$2,653
Sub-total	28					$74,273
>500 emp. no lgwl	1	135	3	0.35	$28.07	$3,979
>500 emp. lgwl	0	135	3	0.35	$28.07	$0
Sub-total	1					$3,979
Total Costs						$91,515

[a] Source: Table IV-46.

Summary Costs for PAPRs and Administrative Controls

Table IV-63 summarizes the compliance costs of the proposed PV rule associated with the use of PAPRs and administrative controls.

Table IV-63:

Summary of Cost Increases Associated With Supplementary Controls [a]

Detail	Section 70	<20 emp.				20 to 500 emp.				>500 emp.				Total			
		First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]
Written Request to Use Supplementary Controls	209(a) & 212(c)(1)	$257	$37	$1,931	$1,968	$2,382	$338	$5,407	$5,746	$257	$37	$193	$230	$2,897	$411	$7,532	$7,943
Post Written Request	217(b)(3)	$9	$1	$68	$69	$84	$12	$190	$202	$9	$1	$7	$8	$102	$14	$264	$279
Write PAPR or Adm. Control Program	210(a) & 213(a)	$2,883	$1,594	$0	$1,594	$13,268	$7,337	$0	$7,337	$1,147	$634	$0	$634	$17,298	$9,566	$0	$9,566
Post Warning Signs	210(a)(3)	$687	$380	$0	$380	$2,280	$1,261	$0	$1,261	$125	$69	$0	$69	$3,092	$1,710	$0	$1,710
Implement Adm. Controls	213	$0	$0	$1,314	$1,314	$0	$0	$14,013	$14,013	$0	$0	$0	$0	$0	$0	$15,326	$15,326
Prepare for PAPR Training	208(a)(2)	$1,208	$85	$0	$85	$5,492	$384	$0	$384	$549	$38	$0	$38	$7,249	$507	$0	$507
Give PAPR Training [b]	210(a)(2)	$0	$0	$2,457	$2,457	$0	$0	$20,014	$20,014	$0	$0	$2,886	$2,886	$0	$0	$25,356	$25,356
Record PAPR Training	210(a)(2)	$0	$0	$91	$91	$0	$0	$755	$755	$0	$0	$110	$110	$0	$0	$956	$956
Purchase PAPRs	210(a)(2)	$53,919	$13,156	$0	$13,156	$245,085	$59,801	$0	$59,801	$24,509	$5,980	$0	$5,980	$323,512	$78,937	$0	$78,937
PAPR Maintenance [c]	210(a)(2)	$0	$0	$91,414	$91,414	$0	$0	$1,638,615	$1,638,615	$0	$0	$389,505	$389,505	$0	$0	$2,119,534	$2,119,534
PAPR Inspection [d]	210(a)(2)	$0	$0	$20,926	$20,926	$0	$0	$463,559	$463,559	$0	$0	$114,328	$114,328	$0	$0	$598,813	$598,813
Total		$58,964	$15,253	$118,200	$133,453	$268,590	$69,133	$2,142,553	$2,211,686	$26,596	$6,760	$507,028	$513,788	$354,150	$91,146	$2,767,781	$2,858,927

[a] Source: Table IV-47 through Table IV-62.

[b] Includes costs from Table IV-55 and Table IV-56.

[c] Includes costs from Table IV-59 and Table IV-60.

[d] Includes costs from Table IV-61 and Table IV-62.

Proposed §70.215(a)
Operators' Quarterly Sampling

If a mine operator's MMU had an MSHA sample result that exceeded the applicable respirable dust standard by at least 0.1 mg/m^3, then the operator would be required to conduct quarterly sampling and submit all such samples and dust data cards to MSHA. MSHA would process the samples and send the results back to the operator. When the operator is under obligation to conduct quarterly sampling, MSHA would continue to conduct its own sampling. If all MSHA sample results and operator quarterly sample results from an MMU required to conduct quarterly sampling, collected over a 12 month period, are at or below the applicable respirable dust standard, then the mine operator would be removed from the obligation to conduct further quarterly sampling. The mine operator would be returned to quarterly sampling if any subsequent MSHA sample result for the MMU exceeded the applicable respirable dust standard by at least 0.1 mg/m^3.

Any operator may voluntarily conduct quarterly sampling at any time and submit such samples and dust data cards to MSHA. Any quarterly samples voluntarily submitted to MSHA by the operator will be processed by MSHA with the results sent back to the operator. Quarterly sample results submitted voluntarily by the operator to MSHA would not be used by the Agency to determine compliance with these requirements. Only MSHA samples would be used to make noncompliance decisions and to determine whether or not an operator would be required to begin quarterly sampling. Any mine operators that opts to use personal-continuous-dust monitors (PCDM's), when they become available, would not be required to submit any quarterly samples as currently specified in the proposed §70.215(f).

For mine operators conducting quarterly sampling, the number of quarterly samples taken differ depending on the situation of the mine operator. Operators would take 1 sample (generally, the DO) per quarter at MMUs where no supplementary controls are being used. Earlier, we assumed that, on average, 3 miners would be using supplementary controls at MMUs where such controls are needed (one of these three miners could be the DO). At MMUs where miners are using supplementary controls for plan verification purposes, we assume that such controls would be used during all four quarterly sampling periods. However, at MMUs where miners are using supplementary controls due to special mining conditions, they would be using such controls with much less frequency. In these cases, MSHA assumes that miners would use supplementary controls during only one of the four quarterly sampling periods.

Therefore, with respect to MMUs at mines conducting quarterly sampling the following would apply: at MMUs where no supplementary controls are used, four samples would be taken annually (one sample per quarter); at MMUs where supplementary controls are used for purposes of plan verification, on average, 12 samples would be taken annually (3 samples for each quarter); and at MMUs where supplementary controls are used due to special mining conditions, 6 samples would be taken annually (3 samples for 1 quarter and 1 sample during each

of the remaining 3 quarters). MSHA assumes that approximately 10 percent of MMUs, in each mine size category, would be required to conduct quarterly sampling each year.

Table IV-64 derives, by size category, the number of annual samples taken by operators as a result of quarterly sampling.

Table IV-64: Section 70.215(a)
Derivation of the Number of Samples Taken Annually
Under the Operator Quarterly Sampling Program

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Ug. Coal Size category	No. of MMUs That Do Not Use Controls [a]	No. of Samples Taken Annually by MMUs in Col. (a) [b]	No. of MMUs Using Controls Under Plan Verif. [a]	No. of Samples Taken Annually by MMUs in Col. (d) [c]	No. of MMUs Using Controls Due to Special Mining Conditions [a]	No. of Samples Taken Annually by MMUs in Col. (f) [d]	Annual No. of Samples Taken by all MMUs [e]
<20 emp.	18.6	4	0.4	12	1.0	6	85.2
20 to 500 emp. no lgwl	51.8	4	1.5	12	2.7	6	241.4
20 to 500 emp. lgwl	1.9	4	2.2	12	0.1	6	34.6
Sub-total	53.7		3.7		2.8		276.0
>500 emp. no lgwl	2.2	4	0.0	12	0.1	6	9.4
>500 emp. lgwl	0.4	4	0.4	12	0.0	6	6.4
Sub-total	2.6		0.4		0.1		15.8
Total	74.9		4.5		3.9		377.0

[a] Source: Table IV-46 [10% x (total MMUs minus MMUs using controls)].

[b] 1 sample taken per quarter.

[c] On average, 3 samples per quarter.

[d] 3 samples for 1 quarter and 1 sample for the 3 remaining quarters.

[e] (col. b x col. c) + (col. d x col. e) + (col. f x col. g).

Operators can only conduct quarterly sampling if they have a verified ventilation plan. The number of quarterly samples shown in Table IV-64 above assumes that all mine operators have verified ventilation plans by the first quarter of the year. This is assumed to be the case for the second year of the proposed PV rule and for every year thereafter. However, in the first year of the proposed PV rule, not all operators will have verified ventilation plans until the fourth quarter of the first year. Therefore, the total number of samples derived in Table IV-64 cannot

be applied to the first year of the proposed PV rule. Rather, some subset of the total number of samples derived in Table IV-6 would apply. The derivation of this subset is described below.

For the first year that the proposed PV rule is in effect, for MMUs at mines employing fewer than 20 workers, MSHA estimates that the number of MMUs that would have a verified ventilation plan would be: 50 MMUs in the first quarter; 100 MMUs in the second quarter; 150 MMUs in the third quarter; and 200 MMUs in the fourth quarter. In the first year, these mine operators could therefore conceivably conduct quarterly sampling a total of 500 times (50 + 100 + 150 + 200). In the second year, at MMUs employing fewer than 20 workers, 200 MMUs could be sampled for each of the four quarterly sampling because at the beginning of the second year all mines would have verified ventilation plans. Therefore, mine operators would have a maximum of 800 chances for which they could be required to conduct quarterly sampling (200 MMUs x 4). The percentage of the total number of MMUs for the first year compared to the MMUs in the second year would be 0.625 (500 MMUs / 800 MMUs). Applying this percentage to the approximately 85 quarterly samples shown in Table IV-64 means that approximately 53 quarterly samples would be taken in the first year, for MMUs required to conduct quarterly sampling at mines employing fewer than 20 workers.

For the first year that the proposed PV rule is in effect, for MMUs at mines employing 20 to 500 workers, MSHA estimates that the number of MMUs that would have a verified ventilation plan would be: 151 MMUs in the first quarter; 302 MMUs in the second quarter; 452 MMUs in the third quarter; and 602 MMUs in the fourth quarter. In the first year, these mine operators could therefore conceivably conduct quarterly sampling a total of 1,507 times (151 + 302 + 452 + 602). In the second year, at MMUs employing 20 to 500 workers, 602 MMUs could be sampled for each of the four quarterly sampling periods. Therefore, mine operators would have a maximum of 2,408 chances for which they could be required to conduct quarterly sampling (602 MMUs x 4). The percentage of the total number of MMUs for the first year compared to MMUs in the second year would be 0.625 (1,507 MMUs / 2,408 MMUs). Applying this percentage to the approximately 276 quarterly samples shown in Table IV-64 means that approximately 172 quarterly samples (151 at non-longwall MMUs and 21 at longwall MMUs) would be taken in the first year, for MMUs required to conduct quarterly sampling at mines employing 20 to 500 workers.

For the first year that the proposed PV rule is in effect, for MMUs at mines employing more than 500 workers, MSHA estimates that the number of MMUs that would have a verified ventilation plan would be: 16 MMUs in the first quarter; 31 MMUs in the second quarter; 31 MMUs in the third quarter; and 31 MMUs in the fourth quarter. In the first year, these mine operators could therefore conceivably conduct quarterly sampling a total of 109 times (16 + 31 + 31 + 31). In the second year, at MMUs employing more than 500 workers, 31 MMUs could be sampled for each of the four quarterly sampling periods. Therefore, mine operators would have a maximum of 124 chances for which they could be required to conduct quarterly sampling (31 MMUs x 4). The percentage of the total number of MMUs in the first year compared to the MMUs in the second year would be 0.88 (109 MMUs / 124 MMUs). Applying this percentage

to the approximately 16 quarterly samples shown in Table IV-64 means that approximately 14 quarterly samples (8 at non-longwall MMUs and 6 at longwall MMUs) would be taken in the first year, for MMUs required to conduct quarterly sampling at mines employing more than 500 workers.

Table IV-65 shows, by size category, the number of quarterly samples taken during the first year that the proposed rule is in effect.

Table IV-65: Section 70.215(a)
Number of Samples Taken in the First Year
Under the Operator Quarterly Sampling Program

Ug. Coal Size category	Total Number of Quarterly Samples Taken in the First Year
<20 emp.	53.3
20 to 500 emp. no lgwl	150.9
20 to 500 emp. lgwl	21.6
Sub-total	172.5
>500 emp. no lgwl	8.3
>500 emp. lgwl	5.6
Sub-total	13.9
Total	239.7

The costs per sample when operators either (1) sample with their own equipment; (2) sample with rented equipment; or (3) contract out their sampling responsibilities, was previously estimated in Table IV-13.

Table IV-66 shows, by mine size, underground coal operators' first year costs to conduct quarterly sampling by using the number of samples from Table IV-65 and the sample costs from Table IV-13.[47]

[47] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-67 shows, by mine size, underground coal operators' annual costs to conduct quarterly sampling by using the number of samples from Table IV-64 and the sample costs from Table IV-13.

Table IV-66: Section 70.215(a)
First Year Costs for Operators to Conduct Quarterly Sampling

Ug. Coal Size category	Total No. of Quarterly Samples Taken in First Year [e]	Cost Per Sample [b]	First Year Costs to Conduct Quarterly Sampling	Annual Costs to Conduct Quarterly Sampling [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annualized [e]
<20 emp.	53.3	$67.84	$3,612	$5,780	-$2,167	-$152
20 to 500 emp. no lgwl	150.9	$65.89	$9,941	$15,905	-$5,964	-$418
20 to 500 emp. lgwl	21.6	$39.59	$856	$1,370	-$514	-$36
Sub-total	172.5		$10,797	$17,275	-$6,478	-$453
>500 emp. no lgwl	8.3	$39.59	$327	$372	-$45	-$3
>500 emp. lgwl	5.6	$39.59	$223	$253	-$30	-$2
Sub-total	13.9		$550	$625	-$75	-$5
Total	239.7		$14,959	$23,680	-$8,720	-$610

[a] Source: Table IV-65.

[b] Source: Table IV-13.

[c] An amount equivalent to annual costs from Table IV-67.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-67: Section 70.215(a)
Annual Costs for Operators to Conduct Quarterly Sampling

Ug. Coal Size category	Annual No. of Samples Taken by all MMUs [a]	Cost Per Sample [b]	Annual Costs to Conduct Quarterly Sampling
<20 emp.	85.2	$67.84	$5,780
20 to 500 emp. no lgwl	241.4	$65.89	$15,905
20 to 500 emp. lgwl	34.6	$39.59	$1,370
Sub-total	276.0		$17,275
>500 emp. no lgwl	9.4	$39.59	$372
>500 emp. lgwl	6.4	$39.59	$253
Sub-total	15.8		$625
Total	377.0		$23,680

[a] Source: Table IV-64.

[b] Source: Table IV-13.

Proposed §70.216(a)
Costs for Completing Dust Cards for Quarterly Sampling and Sending Samples and Dust Cards to MSHA

A completed dust data card must accompany a quarterly sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. The hourly wage rate for a mine safety inspector is the same as a mine supervisor's hourly wage rate of $54.92. Each quarterly sample and its associated dust data card must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60.

As noted earlier, when deriving the proposed SS costs, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Table IV-12 shows that underground coal mine operators conduct their own sampling in all longwall MMUs in mines employing 20 to 500 workers and all MMUs in mines employing more than 500 workers. Table IV-12 also shows that four percent of underground coal mines contract out their sampling responsibilities for MMUs in mines employing fewer than 20 workers, and non-longwall MMUs in mines employing 20 to 500 workers. Therefore, 96 percent of the quarterly samples in these two mine size categories impose operator costs for completing dust data cards and sending them along with the samples to MSHA.

Table IV-68 shows, by size category, underground coal operators' first year costs to complete dust data cards and send them along with their associated quarterly samples to MSHA.[48]

Table IV-69 shows, by size category, underground coal operators' annual costs to complete dust data cards and send them along with their associated quarterly samples to MSHA.

[48] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-68: Proposed 70.216(a)
First Year Costs to Complete Dust Data Cards and
Send Cards and Quarterly Samples to MSHA for Analysis
(for Mines That Conduct Their Own Quarterly Sampling)

Ug. Coal Size category	Total No. of Quarterly Samples Taken in First Year [e]	Cost Per Sample [b]	First Year Costs to Complete Dust Card & Send Card & Sample to MSHA [b]	Annual Costs [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annualized [e]
<20 emp.	51.1	$3.97	$203	$325	-$122	-$9
20 to 500 emp. no lgwl	144.8	$3.97	$575	$920	-$345	-$24
20 to 500 emp. lgwl	21.6	$3.97	$86	$137	-$51	-$4
Sub-total	166.5		$661	$1,057	-$396	-$28
>500 emp. no lgwl	8.3	$3.97	$33	$37	-$4	$0
>500 emp. lgwl	5.6	$3.97	$22	$25	-$3	$0
Sub-total	13.9		$55	$63	-$8	-$1
Total	231.5		$919	$1,444	-$526	-$37

[a] Source: Table IV-65. (Estimates for MMUs in mines employing fewer than 20 workers and non-longwall MMUs in mines employing 20 to 500 workers are 96 percent of figures in Table IV-65.)

[b] Source: Table IV-15.

[c] An amount equivalent to annual costs from Table IV-69.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-69: Proposed 70.216(a)
Annual Costs to Complete Dust Data Cards and
Send Cards and Quarterly Samples to MSHA for Analysis
(for Mines That Conduct Their Own Quarterly Sampling)

Ug. Coal Size Category	No. of Annual Samples [a]	Cost to Complete Dust Card & Send Card & Sample to MSHA[b]	Annual Costs
<20 emp.	81.8	$3.97	$325
20 to 500 emp. no lgwl	231.7	$3.97	$920
20 to 500 emp. lgwl	34.6	$3.97	$137
Sub-total	266.3		$1,057
>500 emp. no lgwl	9.4	$3.97	$37
>500 emp. lgwl	6.4	$3.97	$25
Sub-total	15.8		$63
Total	363.9		$1,444

[a] Source: Table IV-64. (Estimates for MMUs in mines employing fewer than 20 workers and non-longwall MMUs in mines employing 20 to 500 workers are 96 percent of figures in Table IV-64.)

[b] Source: Table IV-15.

Proposed §70.217(b)(1)
Cost to Post Quarterly Sample Results

After processing the quarterly samples, the Agency sends the sampling results to the affected operator. The operator is required to post the one page quarterly sample results. Sampling results are posted for each MMU. For each MMU, the operator would post quarterly samples results four times per year. MSHA estimates that a clerical worker requires 0.1 hours (6 minutes) to copy and post the one page summary of the quarterly sample results. Photocopying costs are estimated to be $0.15 per page.

Table IV-64 shows that the number of mines conducting quarterly sampling annually would be approximately: 20 mines employing fewer than 20 workers; 60 mines employing 20 to 500 workers; and 3 mines employing more than 500 workers. These mines will post quarterly sample results four times per year. Therefore, quarterly sample results would be posted throughout the year: 80 times in mines employing fewer than 20 workers; 240 times in mines employing 20 to 500 workers; and 12 times in mines employing more than 500 workers. In the first year of the proposed rule, the number of times that posting occurs would be: 62.5 percent of the time that it occurs in the second year in mines employing fewer than 20 workers or about 50 times (80 x 0.625), 62.5 percent of the time that it occurs in the second year in mines employing 20 to 500 workers or about 150 times (240 x 0.625), and 88 percent of the time it occurs in the second year in mines employing more than 500 workers or about 11 times (12 x 0.88).

Table IV-70 shows, by size category, underground coal operators' first year costs to copy and post quarterly sample results.[49]

Table IV-71 shows, by size category, underground coal operators' annual costs to copy and post quarterly sample results.

[49] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-70: Proposed 70.217(b)(1)
First Year Costs to Post Quarterly Sample Results

Ug. Coal Size category	No. of Times MMUs Sampled in First Year	Cost to Post Sample Results Per MMU [a]	First Year Costs	Annual Costs [b]	Adjusted First Year Costs [c]	Adjusted First Year Costs Annualized [d]
<20 emp.	50	$2.11	$105	$23	$82	$6
20 to 500 emp. no lgwl	140	$2.11	$295	$66	$229	$16
20 to 500 emp. lgwl	10	$2.11	$21	$5	$16	$1
Sub-total	150		$316	$70	$246	$17
>500 emp. no lgwl	8	$2.11	$17	$3	$14	$1
>500 emp. lgwl	3	$2.11	$6	$1	$5	$0
Sub-total	109		$23	$4	$20	$1
Total	309		$445	$98	$347	$24

[a] Source: Table IV-38.

[b] An amount equivalent to annual costs from Table IV-71.

[c] Adjusted first year costs equal first year costs minus first year of annual costs.

[d] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-71: Proposed 70.217(b)(1)
Annual Costs to Post Quarterly Sample Results

Ug. Coal Size Category	No. of Times MMUs Sampled Annually	Copy Costs for One Posting [a]	Cost to Post Sample Results Per MMU [b]	Total Annual Costs [c]
<20 emp.	80	$0.15	$1.958	$23
20 to 500 emp. no lgwl	224	$0.15	$1.958	$66
20 to 500 emp. lgwl	16	$0.15	$1.958	$5
Sub-total	240			$70
>500 emp. no lgwl	9	$0.15	$1.958	$3
>500 emp. lgwl	3	$0.15	$1.958	$1
Sub-total	12			$4
Total	332			$98

[a] 1 page x $0.15 copy costs per page.

[b] 0.1 hours to copy and post x $19.58 clerical hourly wage rate.

[c] No. of times MMUs sampled annually x ($0.15 + $1.958).

Proposed §70.215(c)(1)
Corrective Actions Related to Quarterly Sampling

If any valid quarterly concentration measurement exceeds the applicable dust standard by 0.10 mg/m^3 or more, the operator must determine the cause and take corrective action to reduce the concentration of respirable coal mine dust to within the applicable dust standard.

The number of overexposures expected during the first year is different from other years. This is because not all MMUs would have a verified ventilation plan. However, MSHA expected that by the end of the first year all MMUs would have verified ventilation plans. The number of overexposures expected during the first year that the proposed PV rule is in effect is 1 for MMUs at mines employing fewer than 20 workers; 4 for MMUs (3 at non-longwall MMUs and 1 at a longwall MMU) at mines employing 20 to 500 workers; and 1 MMU (1 at a non-longwall MMU and 0 at longwall MMUs) at mines employing more than 500 workers. After the first year, and for every year thereafter, the number of overexposures is expected to be 2 for MMUs at mines employing fewer than 20 workers; 6 for MMUs (5 at non-longwall MMUs and 1 at a longwall MMU) at mines employing 20 to 500 workers; and 1 MMU (1 at a non-longwall MMU and 0 at a longwall MMU) at mines employing more than 500 workers. The overexposure estimates above were supplied by MSHA's Office of Coal Mine Safety and Health.

Overexposures related to quarterly sampling would occur at MMUs that already have a verified ventilation plan. These corrective actions would merely augment the initial corrective actions taken to verify the ventilation plan. Therefore, the costs of corrective actions for overexposures related to quarterly sampling are the same as those that appear in Table IV-43, which are also taken after the first year of the proposed PV rule when operators have verified ventilation plans. The corrective action costs in Table IV-43 are equal to approximately 30 percent of the initial corrective actions to verify a mine ventilation plan.

Table IV-72 shows, by size category, underground coal operators' first year costs to take corrective actions related to overexposures resulting from quarterly sampling.[50]

Table IV-73 shows, by size category, underground coal operators' annual costs to take corrective actions related to overexposures resulting from quarterly sampling for each year after the first year.

[50] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-72: Proposed 70.215(c)(1)
First Year Costs for Corrective Actions Related to Quarterly Sampling

Ug. Coal Size Category	No. of Over-exposures in First Year [a]	Corrective Action Costs Per MMU [b]	First Year Costs	Annual Costs [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annualized [e]
<20 emp.	1	$6,261	$6,261	$12,521	-$6,261	-$438
20 to 500 emp. no lgwl	3	$6,261	$18,782	$31,303	-$12,521	-$876
20 to 500 emp. lgwl	1	$23,448	$23,448	$23,448	$0	$0
Sub-total	4		$42,230	$54,751	-$12,521	-$876
>500 emp. no lgwl	1	$6,261	$6,261	$6,261	$0	$0
>500 emp. lgwl	0	$23,448	$0	$0	$0	$0
Sub-total	1		$6,261	$6,261	$0	$0
Total Costs			$54,751	$73,533	-$18,782	-$1,315

[a] Source: MSHA's Office of Coal Mine Safety and Health.

[b] Corrective action costs per MMU from Table IV-43.

[c] An amount equivalent to annual costs from Table IV-73.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equals adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-73: Proposed 70.215(c)(1)
Annual Costs for Corrective Actions
Related to Quarterly Sampling

Ug. Coal Size Category	No. of Annual Overexposures After the First Year [a]	Corrective Action Costs Per MMU [b]	Annual Costs
<20 emp.	2	$6,261	$12,521
20 to 500 emp. no lgwl	5	$6,261	$31,303
20 to 500 emp. lgwl	1	$23,448	$23,448
Sub-total	6		$54,751
>500 emp. no lgwl	1	$6,261	$6,261
>500 emp. lgwl	0	$23,448	$0
Sub-total	1		$6,261
Total Costs			$73,533

[a] Source: MSHA's Office of Coal Mine Safety and Health.

[b] Corrective action costs per MMU from Table IV-43.

Proposed §70.215(c)(2)
Record of Excessive Dust Condition

If any valid quarterly concentration measurement exceeds the applicable dust standard by 0.10 mg/m^3 or more, then a record must be made. The record must include the following: the date of sampling; the location within the mine and the occupation where the sample was collected; the measured dust concentration of each sample collected; and the corrective action being taken to reduce the concentration of respirable coal mine dust.

The number of overexposures, for which a record would be made, in the first year of the proposed PV rule and for every year thereafter, has been derived above. MSHA estimates that a mine supervisor would take 0.1 hours (6 minutes) to make the record.

Table IV-74 shows, by size category, underground coal operators' first year costs to make records for overexposures associated with quarterly sampling.[51]

Table IV-75 shows, by size category, underground coal operators' annual costs to make records for overexposures associated with quarterly sampling.

[51] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-74: Proposed 70.215(c)(2)
First Year Costs to Make Record of Excessive Dust Exposure

Ug. Coal Size Category	No. of Over-exposures in First Year [a]	Cost to Make Record [b]	First Year Costs	Annual Costs [c]	Adjusted First Year Costs [d]	Adjusted First Year Costs Annualized [e]
<20 emp.	1	5.49	$5	$11	-$5	$0
20 to 500 emp. no lgwl	3	5.49	$16	$27	-$11	-$1
20 to 500 emp. lgwl	1	5.49	$5	$5	$0	$0
Sub-total	4		$22	$33	-$11	-$1
>500 emp. no lgwl	1	5.49	$5	$5	$0	$0
>500 emp. lgwl	0	5.49	$0	$0	$0	$0
Sub-total	1		$5	$5	$0	$0
Total	6		$33	$49	-$16	-$1

[a] Source: Table IV-72.

[b] $5.49 = (0.1 x $54.92), where 0.1 is the time to make a record, and $54.92 is the mine supervisor's hourly wage.

[c] An amount equivalent to annual costs from Table IV-75.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-75: Proposed 70.215(c)(2)
Annual Costs to Make Record
of Excessive Dust Exposure

Ug. Coal Size category	No. of Annual Overexposures After the First Year [a]	Cost to Make Record [b]	Annual Costs
<20 emp.	2	$5.49	$11
20 to 500 emp. no lgwl	5	$5.49	$27
20 to 500 emp. lgwl	1	$5.49	$5
Sub-total	6		$33
>500 emp. no lgwl	1	$5.49	$5
>500 emp. lgwl	0	$5.49	$0
Sub-total	1		$5
Total Costs			$49

[a] Source: Table IV-73.

[b] Source: Table IV-74.

Summary Costs of Operators' Quarterly Sampling

Table IV-76 shows costs to operators that are required to conduct quarterly sampling under the proposed PV rule.

Table IV-76:
Summary of Costs Associated With Operator Quarterly Sampling [a]

Detail	Section 70	<20 emp.				20 to 500 emp.				>500 emp.				Total			
		Adjusted First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	Adjusted First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	Adjusted First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]	Adjusted First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs[e]
Conduct Quarterly Sampling	215(a)	-$2,167	-$152	$5,780	$5,628	-$6,478	-$453	$17,275	$16,821	-$75	-$5	$625	$620	-$8,720	-$610	$23,680	$23,069
Complete Dust Cards, Send Cards & Samples to MSHA	216(a)	-$122	-$9	$325	$316	-$396	-$28	$1,057	$1,029	-$8	-$1	$63	$62	-$526	-$37	$1,444	$1,407
Post Samples	217 (b)(1)	$82	$6	$23	$29	$246	$17	$70	$88	$20	$1	$4	$5	$347	$24	$98	$122
Corrective Actions	215 (c)(1)	-$6,261	-$438	$12,521	$12,083	-$12,521	-$876	$54,751	$53,874	$0	$0	$6,261	$6,261	-$18,782	-$1,315	$73,533	$72,218
Record of Excessive Dust	215 (c)(2)	-$5	$0	$11	$11	-$11	-$1	$33	$32	$0	$0	$5	$5	-$16	-$1	$49	$48
Total		-$8,473	-$593	$18,660	$18,067	-$19,161	-$1,341	$73,186	$71,845	-$63	-$4	$6,958	$6,953	-$27,697	-$1,939	$98,803	$96,865

[a] Source: Table IV-66 through Table IV-75.

Proposed §90.204(b)(4)
Operator Sampling Related to Part 90

Under proposed §90.204(b)(2), any time a new or transferred Part 90 miner is sampled and any sample exceeds the respirable dust standard by at least 0.1 mg/m^3, the operator must take corrective action. When this situation occurs, §90.204(b)(4) requires that the operator collect an additional five samples from the affected Part 90 miner. MSHA will evaluate the assigned work environment based on each individual sample result, rather than the average of five sample results. MSHA expects that operators would need to take corrective action and collect an additional five Part 90 samples for, on average, 5 Part 90 miners annually.

The Agency assumes that all 5 Part 90 miners would use some form of administrative control as a corrective action that would not incur any costs. For example, the Part 90 miner could be repositioned within the same work area. However the operator would still need to take 5 additional samples for each of the 5 Part 90 miners. MSHA assumes that 1 of the 5 Part 90 miners would be in a mine employing fewer than 20 workers, while the remaining 4 Part 90 miners would be in mines (2 in longwall mines and 2 in non-longwall mines) employing between 20 and 500 workers. The costs per sample when operators either (1) sample with their own equipment; (2) sample with rented equipment; or (3) contract out their sampling responsibilities, is estimated in Table IV-13.

Table IV-77 shows, by size category, underground coal operators' annual costs to sample Part 90 miners due to proposed §90.204.

Table IV-77: Section 90.204(b)(4)
Annual Costs for Operators to Conduct Part 90 Sampling

Ug. Coal Size category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	No. of Part 90 Samples Taken Per Miner	Cost Per Sample [b]	Annual Costs to Conduct Part 90 Sampling
<20 emp.	1	5	$67.84	$339
20 to 500 emp. no lgwl	2	5	$65.89	$659
20 to 500 emp. lgwl	2	5	$39.59	$396
Sub-total	4			$1,055
>500 emp. no lgwl	0	5	$39.59	$0
>500 emp. lgwl	0	5	$39.59	$0
Sub-total	0			$0
Total	5			$1,394

[a] Source: MSHA Office of Coal Mine safety and Health.

[b] Source: Table IV-13.

Proposed §90.205(c)
Costs for Completing Dust Cards for Part 90 Sampling and Sending Samples and Dust Cards to MSHA

A completed dust data card must accompany each Part 90 sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. The hourly wage rate for a mine safety inspector is the same as a mine supervisor's hourly wage rate of $54.92. Each Part 90 sample and its associated dust data card must be sent to MSHA by operators conducting their own sampling. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60.

As noted earlier, when deriving the proposed SS costs, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Table IV-12 shows that underground coal mine operators conduct their own sampling in all longwall MMUs in mines employing 20 to 500 workers and all MMUs in mines employing more than 500 workers. Table IV-12 also shows that four percent of underground coal mines contract out their sampling responsibilities for MMUs in mines employing fewer than 20 workers, and non-longwall MMUs in mines employing 20 to 500 workers. For purposes of deriving the costs of completing dust data cards and sending them, along with the Part 90 samples, to MSHA, it is assumed that all Part 90 miners affected by this provision are employed at mines that conduct their own sampling.

Table IV-78 shows, by size category, underground coal operators' annual costs to complete dust data cards and send them along with their associated Part 90 samples to MSHA.

Table IV-78: Section 90.205(c)
Annual Costs to Complete Dust Data Cards and
Send Cards and Part 90 Samples to MSHA for Analysis

Ug. Coal Size category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	No. of Part 90 Samples Taken Per Miner	Cost to Complete Dust Card & Send card & Sample to MSHA [b]	Annual Costs
<20 emp.	1	5	$3.97	$20
20 to 500 emp. no lgwl	2	5	$3.97	$40
20 to 500 emp. lgwl	2	5	$3.97	$40
Sub-total	4			$79
>500 emp. no lgwl	0	5	$3.97	$0
>500 emp. lgwl	0	5	$3.97	$0
Sub-total	0			$0
Total	5			$99

[a] Source: MSHA Office of Coal Mine Safety and Health.

[b] Source: Table IV-15.

Proposed §90.206(b)
Provide Copy of Sample Result to Part 90 Miner

Section 90.206(b) requires the operator to provide a copy of the Part 90 sample results to the Part 90 miner. MSHA estimates that a clerical worker would take 0.1 hours (6 minutes) to copy and provide the one page report to the Part 90 miner.

Table IV-79 shows, by size category, underground coal operators' annual costs to provide sample results to Part 90 miners.

Table IV-79: Section 90.206(b)
Annual Costs to Provide Copy of Part 90 Sample Results to Part 90 Miners

Ug. Coal Size category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	Cost to Provide Sample Results to Part 90 Miner [b]	Annual Costs
<20 emp.	1	$2.11	$2
20 to 500 emp. no lgwl	2	$2.11	$4
20 to 500 emp. lgwl	2	$2.11	$4
Sub-total	4		$8
>500 emp. no lgwl	0	$2.11	$0
>500 emp. lgwl	0	$2.11	$0
Sub-total	0		$0
Total	5		$11

[a] Source: MSHA Office of Coal Mine Safety and Health.

[b] $2.11 = (0.1 x $19.58) + (1 x $0.15), where 0.1 is the hours to copy and provide sample results to the Part 90 miner, $19.58 is the clerical worker's hourly wage, 1 is the number of pages, and $0.15 is the photocopying cost per page.

Summary of Operators' Part 90 Annual Costs

Table IV-80 shows operators' costs to conduct Part 90 sampling under the proposed Part 90 rule.

Table IV-80:
Summary of Operators' Part 90 Annual Costs [a]

Detail	Section 90	<20 emp.	20 to 500 emp.	>500 emp.	Total Part 90 Annual Costs
Part 90 Sampling	204(b)	$339	$20	$2	$361
Complete Dust Cards, Send Cards and Samples to MSHA	205(c)	$1,055	$79	$8	$1,143
Provide Sample Results to Miner	206 (b)	$0	$0	$0	$0
Total Costs		$1,394	$99	$11	$1,504

[a] Source: Table IV-77 through Table IV-79.

Proposed §70.220
Personal Continuous Dust Monitor (PCDM)

In accordance with §70.220, an operator may implement a miner protection program based on the use of approved personal continuous dust monitors (PCDM) in conjunction with engineering and administrative controls specified in the ventilation plan. At this time, MSHA has not projected that any mine operator would use PCDMs.

Summary of Proposed PV Increased Costs

Table IV-81 provides, by size category, a summary of underground coal operators' costs for the proposed PV provisions discussed above.

Table IV-81:
Summary of Proposed PV Costs to Operators [a]

Detail	Section	<20 emp.				20 to 500 emp.				>500 emp.				Total			
		Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs
Write Rev. Vent. Plan	75.370	$61,510	$4,306	$8,238	$12,544	$236,075	$16,525	$29,756	$46,281	$15,878	$1,111	$1,788	$2,899	$313,463	$21,942	$39,781	$61,724
Copy & Send Plans	75.370(a)(2) & (a)(3)(I)	$2,404	$168	$322	$490	$8,333	$583	$1,050	$1,634	$480	$34	$54	$88	$11,218	$785	$1,426	$2,212
Post Plans	75.370 (a)(3)(iii)	$539	$38	$72	$110	$2,048	$143	$258	$401	$118	$8	$13	$22	$2,705	$189	$344	$533
Notice of Verf. Sampling	70.201(f)	$877	$61	$117	$179	$2,806	$196	$354	$550	$162	$11	$18	$30	$3,844	$269	$489	$758
PV Sampling	70.204	$6,878	$481	$9,097	$9,578	$27,995	$1,960	$26,226	$28,185	$1,938	$136	$894	$1,029	$36,812	$2,577	$36,216	$38,793
Complete Dust Cards & Send Cards & Samples to MSHA	70.216(a)	$386	$27	$511	$538	$1,981	$139	$1,579	$1,718	$194	$14	$90	$103	$2,561	$179	$2,180	$2,359
Post Sample Results	70.217(b)(1)	$472	$33	$63	$96	$1,510	$106	$190	$296	$87	$6	$10	$16	$2,069	$145	$263	$408
Corrective Actions	70.204	$939,086	$65,736	$187,817	$253,553	$6,447,133	$451,299	$673,610	$1,124,910	$766,465	$53,653	$49,737	$103,389	$8,152,684	$570,688	$911,164	$1,481,852
Control Filter Costs	70.201(d)	$4,244	$297	$617	$914	$13,356	$935	$1,858	$2,793	$749	$52	$96	$148	$18,349	$1,284	$2,571	$3,856
Cost of Supplementary Controls	Various	$58,964	$15,253	$118,200	$133,453	$268,590	$69,133	$2,142,553	$2,211,686	$26,596	$6,760	$507,028	$513,788	$354,150	$91,146	$2,767,781	$2,858,927
Quarterly Sampling	Various	-$8,473	-$593	$18,660	$18,067	-$19,161	-$1,341	$73,186	$71,845	-$63	-$4	$6,958	$6,953	-$27,697	-$1,939	$98,803	$96,865
Part 90 Sampling	Various	$0	$0	$1,394	$1,394	$0	$0	$99	$99	$0	$0	$11	$11	$0	$0	$1,504	$1,504
Total		$1,066,888	$85,808	$345,109	$430,916	$6,990,666	$539,678	$2,950,719	$3,490,398	$812,605	$61,781	$566,695	$628,476	$8,870,159	$687,266	$3,862,523	$4,549,789

[a] Source: Part 90 Sampling costs from Table IV-80, Quarterly Sampling costs from Table IV-76, Costs for Supplemental Controls from Table IV-63, all other costs in Table IV-81 are derived from Tables IV-21 through IV-45.

OVERALL COST REDUCTIONS RELATED TO REDUCED CITATIONS AND THE ELIMINATION OF OPERATOR ABATEMENT SAMPLING THAT OCCUR AS A RESULT OF IMPLEMENTING THE PROPOSED PV RULE

As noted earlier, when operators receive citations they incur related costs, such as costs to take corrective actions and abatement samples. Overall, the Agency estimates that the proposed SS and PV rules would result in a net reduction in the number of citations issued to operators. The proposed PV rule would result in an overall reduction in citations issued to operators because of more efficient mine ventilation plans. This section derives the net reductions in annual citations issued to operators resulting from the proposed SS and PV rules, and then determines operators cost savings resulting from such reductions.

Change in the Number of Citations

In order to estimate the number of citations issued to operators that would be eliminated as a result of the proposed PV rule, we first estimate the number of citations prior to implementation of the proposed PV rule──termed the "baseline" number of citations──and then we estimate the number of citations arising after implementation of the proposed PV rule. This latter number minus the baseline number of citations provides our estimate of the number of citations issued to operators that would be eliminated as a result of the proposed PV rule.

Recall that we previously estimated the effect of the proposed SS rule and that, for expositional purposes, we assumed that the proposed SS rule preceded the proposed PV rule. Recall further that the proposed SS rule applies to MSHA inspector sampling but not to operator sampling. As a result, the baseline number of citations prior to implementation of the proposed PV rule includes the effect of the proposed SS on MSHA inspector samples. The total estimated annual baseline number of operator citations from both MSHA inspector and operator sampling is therefore the sum of the following three elements that are shown in Table IV-82:

- Row 1 shows citations based on operator citations using the averaging method;
- Row 2 shows citations based on MSHA samples using the averaging method;
- Row 3 shows additional citations based on MSHA sample using the single sample method; and
- Row 4 sums Rows 1, 2 and 3 to show total annual baseline citations issued to operators.

We turn now to estimation of the number of citations after implementation of the proposed PV rule. Table IV-82 shows the following:

- Row 5 shows citations issued to operators in the first year of the proposed PV Rule; and
- Row 6 subtracts Row 5 (citations in the first year of the proposed PV rule) from Row 4 (total baseline citations) to arrive at citation savings in the first year of the proposed PV rule; while
- Row 7 shows citations issued to operators in the second year of the proposed PV rule, and for every year thereafter; and
- Row 8 subtracts Row 7 (citations in the second year of the proposed PV rule) from Row 4 (total baseline citations).

Table IV-82: Citations Eliminated as a Result of the PV Rule *

Row No.	Type of Citation for Excessive Dust	<20 emp.								20 to 500 emp.								>500 emp.							
		MMU	RB-DA	I-DA	O-DA	P90	DWP	NDWP	Total	MMU	RB-DA	I-DA	O-DA	P90	DWP	NDWP	Total	MMU	RB-DA	I-DA	O-DA	P90	DWP	NDWP	Total
1	Citations Based on Operator Samples Using Averaging Method	42	3	0	0	0	0	0	45	291	26	2	1	0	0	0	320	13	0	0	0	0	0	0	13
2	Citations Based on MSHA Samples Using Averaging Method	13	5	0	0	0	0	0	18	22	3	1	0	0	0	0	26	0	0	0	0	0	0	0	0
3	Additional Citations Based on MSHA Samples Using Single Sample	95	20	2	1	3	0	0	121	518	135	28	19	7	1	0	708	26	0	6	0	0	0	0	32
4	Total Baseline Citations (Rows 1+2+3)	150	28	2	1	3	0	0	184	831	164	31	20	7	1	0	1,054	39	0	6	0	0	0	0	45
5	Citations in 1st Year of PV Rule	51	11	2	1	3	0	0	68	255	66	29	19	7	1	0	377	10	0	6	0	0	0	0	16
6	Citations Savings in 1st Year of PV Rule (Row 4 - Row 5)	99	17	0	0	0	0	0	116	576	98	2	1	0	0	0	677	29	0	0	0	0	0	0	29
7	Citations in 2nd Year of PV Rule	15	3	2	1	3	0	0	24	65	16	29	19	7	0	0	136	4	0	6	0	0	0	0	10
8	Citations Savings in 2nd Year of PV Rule and Every Year Thereafter (Row 4 - Row 7)	135	25	0	0	0	0	0	160	766	148	2	1	0	1	0	918	35	0	0	0	0	0	0	35

* Source: MSHA's Office of Coal Safety and Health.

Corrective Action Cost Reductions Related to the Reduced Number of Citations

To calculate the corrective action cost savings arising from the reduction in the number of citations based on MSHA inspector sample results, MSHA used the same corrective action costs that were derived earlier when calculating the corrective action compliance costs associated with additional citations in the proposed SS cost analysis.

As determined earlier, for underground mines, the corrective action costs were $1,519 for an MMU or RB-DA citation in a non-longwall mine, and $2,056 for an MMU or RB-DA citation in a longwall mine. For all other types of citations in underground mines, costs for the corrective actions were estimated at $200 per citation in mines that employ fewer than 20 workers and $400 per citation in mines that employ 20 or more workers.

As noted earlier, the assumptions underlying these corrective action costs was provided by the Agency's technical staff in MSHA's Office of Coal Mine Safety and Health. The estimates are based on the technical staff's: (1) knowledge of the engineering controls that are currently available and that are used in underground coal mines, (2) experience with the effectiveness of those controls in the underground coal mining environment; (3) experience with the procedures currently used to abate situations of non-compliance; and (4) experience with compliance and non-compliance rates in the underground coal mining sector.

These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original installation costs.[52]

Furthermore, as MSHA previously assumed, corrective actions unique to the proposed SS cost analysis would have been taken for only 40 percent of the (additional) citations to non-longwall underground mines and 60 percent of the (additional) citations to underground longwall operators. These same percentages apply to the operator savings arising from a reduction in citations. Table IV-83 takes these same percentages and applies them to the citations saved that are shown in Row 6 of Table IV-82 to arrive at the number of eliminated citations that would have associated corrective action cost savings for the first year that the proposed PV rule is in effect. Table IV-84 takes the percentages discussed above and applies them to the citations saved that are shown in Row 8 of Table IV-82 to arrive at the number of eliminated citations that

[52] The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C)/(1 + 0.07)^{i}$$

where C is the cost of installing the corrective action, 0.07 is the discount rate, and i represents the n^{th} year after the rule takes effect. This equation for S can be simplified to equal (0.25 x C/0.07).

would have associated corrective action cost savings for the second year that the proposed PV rule is in effect, and for every year thereafter.

Table IV-83: Number of Citations Eliminated in the First Year of Proposed PV Rule That Have Associated Corrective Action Cost Savings

(a)	(b)	(c)	(d)	(e)
			Citations Associated With Corrective Action Cost Savings	
Ug. Coal Size category	No. of Reduced MMU & RB-DA Citations [a]	No. of Reduced All Other Citations [a]	No. of Reduced MMU & RB-DA Citations [b]	No. of Reduced All Other Citations [b]
<20 emp.	116	0	46	0
20 to 500 emp. no lgwl	593	2.6	237	1.1
20 to 500 emp. lgwl	81	0.4	49	0.2
Sub-total	674	3	286	1.3
>500 emp. no lgwl	26	0	10	0
>500 emp. lgwl	3	0	2	0
Sub-total	29	0	12	
Total	819	3	344	1.3

[a] Source: Table IV-82 (Row 6). All other citations refer to I-DA, O-DA, P-90, DWP, and NDWP citations. Citations for size categories employing 20 or more workers are apportioned 88 percent to non-longwalls and 12 percent to longwalls.

[b] Citations in columns (d) and (e) are 40 percent of non-longwall citations and 60 percent of longwall citations in columns (b) and (c).

Table IV-84: Number of Citations Eliminated in the Second Year of the Proposed PV Rule and Every Year Thereafter That Have Associated Corrective Action Cost Savings

(a)	(b)	(c)	(d)	(e)
			Citations Associated With Corrective Action Cost Savings	
Ug. Coal Size category	No. of Reduced MMU & RB-DA Citations [a]	No. of Reduced All Other Citations [a]	No. of Reduced MMU & RB-DA Citations [b]	No. of Reduced All Other Citations [b]
<20 emp.	160	0	64	0
20 to 500 emp. no lgwl	804	3.5	322	1.4
20 to 500 emp. lgwl	110	0.5	66	0.3
Sub-total	914	4	388	1.7
>500 emp. no lgwl	31	0	12	0
>500 emp. lgwl	4	0	3	0
Sub-total	35	0	15	
Total	1,109	4	466	1.7

[a] Source: Table IV-82 (Row 8). All other citations refer to I-DA, O-DA, P-90, DWP, and NDWP citations. Citations for size categories employing 20 or more workers are apportioned 88 percent to non-longwalls and 12 percent to longwalls.

[b] Citations in columns (d) and (e) are 40 percent of non-longwall citations and 60 percent of longwall citations in columns (b) and (c).

Table IV-85 shows, by size category, underground coal operators' first year corrective action cost savings due to the reduction in the number of citations issued to operators.[53]

Table IV-86 shows, by size category, underground coal operators' annual corrective action cost savings due to a reduction in the number of citations issued to operators.

[53] Note that the adjusted first year costs are negative numbers. This is because, even though the first year costs are positive, they are less than the annual costs in each subsequent year.

Table IV-85: First Year Corrective Action Cost Savings
For Citations Eliminated as a Result of the Proposed PV Rule

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Ug. Coal Size Category	No. of Reduced MMU & RB-DA Citations[a]	No. of Reduced All Other Citations [a]	MMU & RB-DA Corrective Action Costs per Citation[b]	All Other Corrective Action Costs per Citation[b]	First Year Cost Savings[c]	Annual Cost Savings[d]	Adj. First Year Cost Savings[e]	Adj. First Year Cost Savings Annual-ized[f]
<20 emp.	46	0	$6,944	$914	$322,202	$444,416	-$122,214	-$8,555
20 to 500 emp. no lgwl	237	1.1	$6,944	$1,829	$1,649,381	$2,236,654	-$587,273	-$41,109
20 to 500 emp. lgwl	49	0.2	$9,399	$1,829	$456,503	$619,047	-$162,544	-$11,378
Sub-total	286	1			$2,105,884	$2,855,700	-$749,817	-$52,487
>500 emp. no lgwl	10	0	$6,944	$1,829	$70,884	$85,550	-$14,666	-$1,027
>500 emp. lgwl	2	0	$9,399	$1,829	$19,625	$23,685	-$4,060	-$284
Sub-total	12	0			$90,509	$109,235	-$18,726	-$1,311
Total	344	1			$2,518,595	$3,409,352	-$890,757	-$62,353

[a] Source: Table IV-83.

[b] Source: Table IV-6.

[c] (col. b x col. d) + (col. c x col. e).

[d] An amount equivalent to annual costs from Table IV-86.

[e] Adjusted first year costs equal first year costs minus first year of annual costs.

[f] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-86: Annual Corrective Action Cost Savings
For Citations Eliminated as a Result of the Proposed PV Rule

(a)	(b)	(c)	(d)	(e)	(f)
Ug. Coal Size Category	No. of Reduced MMU & RB-DA Citations[a]	No. of Reduced All Other Citations [a]	MMU & RB-DA Corrective Action Costs per Citation[b]	All Other Corrective Action Costs per Citation[b]	Annual Costs Savings[c]
<20 emp.	64	0	$6,944	$914	$444,416
20 to 500 emp. no lgwl	322	1.4	$6,944	$1,829	$2,236,654
20 to 500 emp. lgwl	66	0.3	$9,399	$1,829	$619,047
Sub-total	388	2			$2,855,700
>500 emp. no lgwl	12	0	$6,944	$1,829	$85,550
>500 emp. lgwl	3	0	$9,399	$1,829	$23,685
Sub-total	15	0			$109,235
Total	466	2			$3,409,352

[a] Source: Table IV-84.

[b] Source: Table IV-6.

[c] (col. b x col. d) + (col. c x col. e).

Existing §§ 70.201(d) & 90.201(d)
Annual Abatement Sampling Cost Reductions from the Elimination of Abatement Sampling

Under current requirements (before the PV rule is implemented), operator sampling is still in effect and, in order to abate a citation, the operator must take abatement samples after corrective actions are taken. Under the proposed PV rule all abatement sampling by operators would be eliminated. Therefore, the reduction in operator abatement sampling occurs not only for the citations that would be eliminated because of the proposed PV rule, but also for those citations that remain.

Currently, the operator takes a set of 5 single full-shift abatement samples on different shifts, for each citation received. To estimate the abatement sampling cost reductions due to the PV rule, this analysis assumes that operators would be able to come back into compliance after their first set of five abatement samples. A second set of five abatement samples would not be needed.

As noted earlier, abatement sampling costs are not the same for all coal operators. Some operators perform their own sampling with their own sampling equipment. Other operators perform their own sampling but do not own any equipment and thus must rent the sampling equipment. Finally, some operators transfer their sampling responsibilities to contractors who perform the sampling with their (the contractors') own equipment. Table IV-13 shows the estimated breakdown of sampling rates for underground coal operators according to the method of sampling they use.

Table IV-87 shows, by size category, underground coal operators' annual abatement sampling cost savings due to the elimination of operator abatement sampling resulting from the proposed PV rule.

Table IV-87: Existing 70.201(d) & 90.201(d)
Annual Abatement Sampling Cost Savings
as a Result of the Proposed PV Rule

Ug. Coal Size Category	No. of Citations[a]	No. of Samples Per Citation	Cost per Sample[b]	Annual Cost Savings
<20 emp.	184	5	$67.84	$62,408
20 to 500 emp. no lgwl	928	5	$65.89	$305,557
20 to 500 emp. lgwl	126	5	$39.59	$25,036
Sub-total	1,054			$330,592
>500 emp. no lgwl	40	5	$39.59	$7,838
>500 emp. lgwl	5	5	$39.59	$1,069
Sub-total	45			$8,907
Total	1,283			$401,908

[a] Source: Table IV-82 (Row 4). Citations for size categories employing 20 or more workers are apportioned 88 percent to non-longwalls and 12 percent to longwalls.

[b] Source: Table IV-13.

Existing §§ 70.209(c) & 90.209(c)
Annual Cost Reduction for Completing Dust Data Cards and Sending Abatement Samples and Dust Data Cards to MSHA

After each abatement sample is taken, a dust data card must be filled out. The card is provided by the manufacturer when the operator purchases a filter cassette. After the information is recorded on the card, a certified person signs it and writes the certification number on the card. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector hourly wage rate is similar to a mine supervisor's wage rate of $54.92. Each abatement sample, along with the dust data card, must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60. Since operators would no longer perform abatement sampling, the above costs would be avoided.

As noted earlier, when deriving the proposed SS costs, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Table IV-12 shows that underground coal mine operators conduct their own sampling in all longwall MMUs in mines employing 20 to 500 workers and all MMUs in mines employing more than 500 workers. Table IV-12 also shows that four percent of underground coal mines contract out their sampling responsibilities for MMUs in mines employing fewer than 20 workers, and non-longwall MMUs in mines employing 20 to 500 workers. Therefore, 96 percent of the quarterly samples in these two mine size categories impose operator costs for completing dust data cards and sending them along with verification samples to MSHA.

Table IV-88 shows, by size category, underground coal operators' annual cost savings for no longer having to complete dust data cards and send cards along with abatement samples to MSHA.

Table IV-88: Existing 70.209(c)
Annual Cost Savings for Completing Dust Cards
and Send Cards and Abatement Samples to MSHA
as a Result of the Proposed PV Rule

Ug. Coal Size Category	No. of Citations[a]	No. of Samples Per Citation	Cost to Complete Dust Card & Send Sample & Dust Card to MSHA [b]	Annual Cost Savings
<20 emp.	177	5	$3.97	$3,505
20 to 500 emp. no lgwl	890	5	$3.97	$17,666
20 to 500 emp. lgwl	126	5	$3.97	$2,509
Sub-total	1,017			$20,175
>500 emp. no lgwl	40	5	$3.97	$786
>500 emp. lgwl	5	5	$3.97	$107
Sub-total	45			$893
Total	1,239			$24,573

[a] Source: Table IV-82 (Row 4). Citations for size categories employing 20 or more workers are apportioned 88 percent to non-longwalls and 12 percent to longwalls. Estimates for size categories <20 employees and 2o to 500 employees for non-longwalls are reduced by four percent to reflect that 96 percent of operators in these categories conduct their own sampling and complete their own dust data cards.

[b] Source: Table IV-15.

Existing §§ 70.210(b) & 90.210(b)
Annual Cost Reductions to Post Abatement Sample Results from the Elimination of Abatement Sampling

After MSHA analyzes the abatement samples, the Agency sends the sample results back to the operator. Upon receiving the sample results, the operator must post them on the mine bulletin board. For costing purposes, it is assumed that the five abatement sample results are sent back to the operator on one page. Thus, for each citation, one page worth of sample results needs to be posted. MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the results. Photocopying costs per page are estimated to be $0.15. Because of the elimination of operator abatement sampling, the above costs would be avoided.

With respect to part 90 citations, existing § 90.210(b) states that the operator does not need to post the sample results, but rather must give a copy to the miner. MSHA assumes that it would take the same amount of time to copy and give the results to the miner as it would to copy and post the results.

Table IV-89 shows, by size category, underground coal operators' annual cost savings of from longer having to post sample results due to the elimination of abatement sampling.

Table IV-89: Existing 70.210(b) & 90.210(b)
Annual Cost Savings for Posting Sample Results
as a Result of the Proposed PV Rule

Ug. Coal Size Category	No. of Citations[a]	Cost to Post Sample Results Per Citation [b]	Annual Cost Savings
<20 emp.	184	$2.11	$388
20 to 500 emp. no lgwl	928	$2.11	$1,955
20 to 500 emp. lgwl	126	$2.11	$267
Sub-total	1,054		$2,222
>500 emp. no lgwl	40	$2.11	$83
>500 emp. lgwl	5	$2.11	$11
Sub-total	45		$95
Total	1,283		$2,705

[a] Source: Table IV-82 (Row 4). Citations for size categories employing 20 or more workers are apportioned 88 percent to non-longwalls and 12 percent to longwalls.

[b] Source: Table IV-16.

Summary of Cost Savings Due to Reduced Citations Issued to Operators and the Elimination of Operator Abatement Sampling

Table IV-90 shows, by size category, underground coal operators' cost saving due to reduced citations issued to operators and the elimination of operator abatement sampling. Table IV-90 does not show penalty cost savings from reduced citations. Those costs will be derived following Table IV-90.

Table IV-90:
Summary of Cost Savings Due to Reduced Citations Issued to Operators and the Elimination of Operator Abatement Sampling
(Excludes Penalty Cost Savings)

		<20 emp.				20 to 500 emp.				>500 emp.				Total			
Detail	Sections 70 & 90	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings
Corrective Actions [a]		-$122,214	-$8,555	$444,416	$435,861	-$749,817	-$52,487	$2,855,700	$2,803,213	-$18,726	-$1,311	$109,235	$107,924	-$890,757	-$62,353	$3,409,352	$3,346,999
Abatement Sampling [b]	201(d) & 201(d)	$0	$0	$62,408	$62,408	$0	$0	$330,592	$330,592	$0	$0	$8,907	$8,907	$0	$0	$401,908	$401,908
Complete Dust Cards & Send Cards & Samples to MSHA [c]	209(c) & 209(c)	$0	$0	$3,505	$3,505	$0	$0	$20,175	$20,175	$0	$0	$893	$893	$0	$0	$24,573	$24,573
Post Samples [d]	210(b)	$0	$0	$388	$388	$0	$0	$2,222	$2,222	$0	$0	$95	$95	$0	$0	$2,705	$2,705
Total		-$122,214	-$8,555	$510,717	$502,162	-$749,817	-$52,487	$3,208,690	$3,156,203	-$18,726	-$1,311	$119,130	$117,819	-$890,757	-$62,353	$3,838,537	$3,776,184

[a] Source: Table IV-85 and Table IV-86.

[b] Source: Table IV-87.

[c] Source: Table IV-88.

[d] Source: Table IV-89.

Penalty Cost Reductions Related to Reduced Citations Issued to Operators for Excessive Dust Violations

Once an operator is issued a citation for an excessive dust violation, the operator is assessed a monetary penalty. Even if an operator successfully abates the citation with abatement samples, the operator must still pay the monetary penalty. The dollar amount of the penalty is not the same for every citation; its determination is based on a set of criteria that is presented in 30 CFR §100.3.

Table IV-91 shows, by size category and by entity type, the number of reduced citations issued to operators for excessive dust violations that would result in the first year of the proposed PV rule, the penalty charges for each entity type, and underground coal operators' first year penalty cost savings resulting from the reduced citations.[54]

Table IV-92 shows, by size category and by entity type, the number of reduced citations issued to operators for excessive dust violations that would result in the second year, and every year thereafter, of the proposed PV rule, the penalty charges for each entity type, and underground coal operators' annual penalty cost savings resulting from the reduced citations.

[54] If an operator has an excessive history of violations in a certain category, then the penalty assessed for each additional citation in that category is increased. To the extent that the PV rule would result in eliminating the majority of current citations, then, on average, operators can expect additional savings because smaller penalties would be assessed in the future.

Table IV-91: First Year Penalty Cost Savings Resulting From Reduced Citations Issued to Operators For Excessive Dust Violations

Ug. Coal Size Category	Citation Type						Total	Annual Cost Savings[c]	Adj. First Year Cost Savings[d]	Adj. First Year Cost Savings Annual-ized [e]
	MMU	RB DA	Intake DA	Outby DA	P-90	DWP				
Number of Reduced Citations [a]										
<20 emp.	99	17	0	0	0	0	116			
20 to 500 emp.	576	98	2	1	0	0	677			
>500 emp.	29	0	0	0	0	0	29			
Ug. Total	704	115	2	1	0	0	822			
Penalty Charges Per Citation [b]										
<20 emp.	$525	$400	$0	$0	$0	$0				
20 to 500 emp.	$2,700	$1,535	$430	$430	$0	$0				
>500 emp.	$1,495	$0	$0	$0	$0	$0				
First Year Penalty Cost Savings										
<20 emp.	$51,975	$6,800	$0	$0	$0	$0	$58,775	$80,875	-$22,100	-$1,547
20 to 500 emp.	$1,555,200	$150,430	$860	$430	$0	$0	$1,706,920	$2,296,670	-$589,750	-$41,283
>500 emp.	$43,355	$0	$0	$0	$0	$0	$43,355	$52,325	-$8,970	-$628
Total							$1,809,050	$2,429,870	-$620,820	-$43,457

[a] Source: Table IV-82 (Row 6).

[b] Source: MSHA's Office of Coal Safety and Health.

[c] An amount equivalent to annual costs from Table IV-92.

[d] Adjusted first year costs equal first year costs minus first year of annual costs.

[e] Adjusted first year costs annualized equal adjusted first year costs multiplied by 0.07, where 0.07 is the annualization factor.

Table IV-92: Annual Penalty Cost Savings Resulting From Reduced Citations Issued to Operators For Excessive Dust Violations

Ug. Coal Size Category	Citation Type MMU	RB DA	Intake DA	Outby DA	P-90	DWP	Total
Number of Reduced Citations [a]							
<20 emp.	135	25	0	0	0	0	160
20 to 500 emp.	766	148	2	1	0	1	918
>500 emp.	35	0	0	0	0	0	35
Ug. Total	936	173	2	1	0	1	1,113
Penalty Charges Per Citation [b]							
<20 emp.	$525	$400	$0	$0	$0	$0	
20 to 500 emp.	$2,700	$1,535	$430	$430	$0	$0	
>500 emp.	$1,495	$0	$0	$0	$0	$0	
Annual Penalty Cost Savings							
<20 emp.	$70,875	$10,000	$0	$0	$0	$0	$80,875
20 to 500 emp.	$2,068,200	$227,180	$860	$430	$0	$0	$2,296,670
>500 emp.	$52,325	$0	$0	$0	$0	$0	$52,325
Annual Cost Savings							$2,429,870

[a] Source: Table IV-82 (Row 8).

[b] Source: MSHA Office of Coal Safety and Health.

Annual Penalty Cost Reductions Related to Reduced Citations Issued to Operators for Failure to Conduct Sampling

Once an operator is issued a citation for failure to sample, the operator is assessed a monetary penalty. MSHA expects that the number of citations issued for failure to sample would decrease under the proposed PV rule. This reduction occurs due to the substantial change in operator sampling requirements that result from the proposed PV rule. Sampling entities, such as, designated areas (DAs) are no longer required to be sampled by the operator and MMU sampling by the operator has been reduced from 30 shifts per year to approximately four shifts per year. Table IV-93 subtracts, by size category, the number of citations expected under the proposed rule from those currently issued in order to obtain the number of reduced citations for failure to sample. MSHA assumes that the number of citations for failure to conduct sampling under the proposed PV rule would be the same each year, starting in the first year the rule takes effect.

Table IV-93:
Number of Reduced Citations
Related to Failure to Sample

Citations for Failure to Sample	<20 emp.	20 to 500 emp.	>500 emp.	Total
Under Existing Regulations [a]	206	369	17	592
Under PV Rule [a]	23	42	2	67
No. of Reduced Citations	183	327	15	525

[a] Source: MSHA's Office of Coal Mine Safety and Health. Citations for the category "Under Existing Regulations" are from the period August 1, 2001 through July 31, 2002.

The average penalty charge per citation issued for failure to sample during the same period noted above was: $419 at MMUs employing fewer than 20 workers, $1,660 at MMUs employing 20 to 500 workers; and $974 at MMUs employing more than 500 workers. These cost figures were calculated from information supplied by MSHA's Office of Coal Mine Safety and Health.

Table IV-94 shows, by size category, underground coal operators' annual cost savings due to reduced citations issued to operators for failure to sample.

Table IV-94:
Annual Cost Savings for Reduced Citations
Related to Failure to Sample

Ug. Coal Size Category	Reduced No. of Citations [a]	Avg. Cost Per Citation	Annual Penalty Cost Savings
<20 emp.	183	$419	$76,677
20 to 500 emp.	327	$1,660	$542,820
>500 emp.	15	$974	$14,610
Total Costs			$634,107

[a] Source: Table IV-93.

Summary of Penalty Cost Savings Related to Reduced Citations

Table IV-95 summarizes, by size category, the penalty cost savings to underground coal operators from reduced citations issued to operators.

Table IV-95:
Summary of Penalty Cost Savings
Due to Reduced Citations Issued to Operators

Detail	<20 emp.				20 to 500 emp.				>500 emp.				Total			
	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings	First Year Cost Savings	Annual-ized Cost Savings	Annual Cost Savings	Yearly Cost Savings
Reduced Citation Penalties Due to Excessive Dust [a]	-$22,100	-$1,547	$80,875	$79,328	-$589,750	-$41,283	$2,296,670	$2,255,388	-$8,970	-$628	$52,325	$51,697	-$620,820	-$43,457	$2,429,870	$2,386,413
Reduced Citation Penalties Due to Failure to Sample [b]	$0	$0	$76,677	$76,677	$0	$0	$542,820	$542,820	$0	$0	$14,610	$14,610	$0	$0	$634,107	$634,107
Total	-$22,100	-$1,547	$157,552	$156,005	-$589,750	-$41,283	$2,839,490	$2,798,208	-$8,970	-$628	$66,935	$66,307	-$620,820	-$43,457	$3,063,977	$3,020,520

[a] **Source: Table IV-91 and Table IV-92.**

[b] **Source: Table IV-94.**

COST SAVINGS DUE TO THE ELIMINATION OF OPERATOR BI-MONTHLY SAMPLING

Above we derived cost savings to operators related to citations that are no longer expected to occur as a result of the PV rule. In addition, under the proposed PV rule, the existing bi-monthly operator sampling program would be eliminated. The elimination of operator bi-monthly sampling would lead to a cost savings for operators. Operators would realize cost savings as a result of: taking fewer samples; completing fewer dust data cards; sending fewer samples and related dust cards to MSHA for analysis; and posting fewer sample results. The estimated operator sampling reduction and related cost reduction is described below.

Annual Number of Samples Taken by Operators Under the Bi-Monthly Sampling Program

Under the existing bi-monthly sampling program operators take 5 samples per MMU. DA and Part 90 samples are also taken. MSHA estimates that, on average, 1 DA sample is taken per MMU. If the one DA sample taken is over the applicable dust standard, the operator is not cited based on the one DA sample; however, the operator must take 5 more DA samples. An operator would be cited if the average of the 5 DA samples showed an overexposure. The annual number of samples taken under the current bi-monthly sampling program are estimated as follows:

- For MMUs employing fewer than 20 workers, MSHA estimates that there would be 7,824 samples taken annually, which consist of:
  (5 samples x 200 MMUs x 6 times/year) +
  (1 DA sample x 200 MMUs x 6 times/year) +
  (1 DA sample x 200 MMUs x 6 times/year x 0.10 x 5 samples) +
  (4 Part 90 miners x 1 sample x 6 times/year).

- For non-longwall MMUs employing 20 to 500 workers, MSHA estimates that there would be 22,086 samples taken annually, which consist of:
  (5 samples x 560 MMUs x 6 times/year) +
  (1 DA sample x 560 MMUs x 6 times/year) +
  (1 DA sample x 560 MMUs x 6 times/year x 0.10 x 5 samples) +
  (41 Part 90 miners x 1 sample x 6 times/year).

- For longwall MMUs employing 20 to 500 workers, MSHA estimates that there would be 1,638 samples taken annually, which consist of:
  (5 samples x 42 MMUs x 6 times/year) +
  (1 DA sample x 42 MMUs x 6 times/year) +
  (1 DA sample x 42 MMUs x 6 times/year x 0.10 x 5 samples).

- For non-longwall MMUs employing more than 500 workers, MSHA estimates that there would be 933 samples taken annually, which consist of:

(5 samples x 23 MMUs x 6 times/year) +
(1 DA sample x 23 MMUs x 6 times/year) +
(1 DA sample x 23 MMUs x 6 times/year x 0.10 x 5 samples) +
(6 Part 90 miners x 1 sample x 6 times/year).

- For longwall MMUs employing more than 500 workers, MSHA estimates that there would be 312 samples taken annually, which consist of:
  (5 samples x 8 MMUs x 6 times/year) +
  (1 DA sample x 8 MMUs x 6 times/year) +
  (1 DA sample x 8 MMUs x 6 times/year x 0.10 x 5 samples).

Table IV-96 shows, by size category, the annual number of reduced operator samples that would occur as a result of eliminating operator bi-monthly sampling.

Table IV-96:
Annual Number of Samples Taken by Operators
Under the Bi-monthly Sampling Program

Ug. Coal Size Category	No. of Samples Taken Under the Operator Bi-Monthly Sampling Program
<20 emp.	7,824
20 to 500 emp. no lgwl	22,086
20 to 500 emp. lgwl	1,638
Sub-total	23,724
>500 emp. no lgwl	933
>500 emp. lgwl	312
Sub-total	1,245
Total	32,793

Proposed §70.215
Annual Sampling Cost Savings Due to the Elimination of Operator Bi-monthly Sampling

The decrease in the number of samples that operators would have to take is shown in Table IV-96. The costs per sample when operators either (1) sample with their own sampling equipment; (2) sample with rented equipment; or (3) contract out their sampling responsibilities, was previously estimated in Table IV-13.

Table IV-97 shows, by size category, underground coal operators' annual cost savings due to the elimination of operator bi-monthly sampling.

Table IV-97:
Annual Sampling Cost Savings
Due to the Elimination of Operator Bi-onthly Sampling

Ug. Coal Size category	Annual No. of Reduced Samples [a]	Cost Per Sample [b]	Annual Cost Savings
<20 emp.	7,824	$67.84	$530,741
20 to 500 emp. no lgwl	22,086	$65.89	$1,455,176
20 to 500 emp. lgwl	1,638	$39.59	$64,846
Sub-total	23,724		$1,520,022
>500 emp. no lgwl	933	$39.59	$36,936
>500 emp. lgwl	312	$39.59	$12,352
Sub-total	1,245		$49,287
Total	32,793		$2,100,050

[a] Source: Table IV-96.

[b] Source: Table IV-13.

Proposed §70.215
Annual Cost Savings Related to Completing Fewer Dust Data Cards and Sending Dust Data Cards and Samples to MSHA, Due to the Elimination of Operator Bi-monthly Sampling

Operator sampling would decrease as a result of operators eliminating bi-monthly sampling. Operators would no longer need to complete the dust data cards associated with samples no longer taken. Therefore, operators would realize cost savings from not spending time to complete dust data cards and sending the cards along with the samples to MSHA for analysis. Since a dust data card must be completed for each sample, the number of dust data cards no longer needed to be completed equals the number of reduced samples, which was derived above.

MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. The hourly wage rate for a mine safety inspector is the same as a mine supervisor's hourly wage rate of $54.92. Each sample and its associated dust data card must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA. Postage costs to mail one sample is estimated to be $0.60.

As noted earlier, when deriving the proposed SS costs, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Table IV-12 shows that underground coal mine operators conduct their own sampling in all longwall MMUs in mines employing 20 to 500 workers and all MMUs in mines employing more than 500 workers. Table IV-12 also shows that four percent of underground coal mines contract out their sampling responsibilities for MMUs in mines employing fewer than 20 workers, and non-longwall MMUs in mines employing 20 to 500 workers. Therefore, 96 percent of the samples in these two mine size categories impose operator costs for completing dust data cards and sending them along with the samples to MSHA.

Table IV-98 shows, by size category, underground coal operators' annual cost savings related to no longer having to complete dust data cards and send them along with the samples to MSHA due to the elimination of operator bi-monthly sampling.

Table IV-98:
Annual Costs Related to No Longer Completing Dust Data Cards and Sending Cards and Samples to MSHA for Analysis Due to the Elimination of Operator Bi-monthly Sampling (for Mines That Conduct Their Own Sampling)

Ug. Coal Size Category	Annual No. of Reduced Samples [a]	Cost Per Sample [b]	Annual Cost Savings
<20 emp.	7,511	$3.97	$29,804
20 to 500 emp. no lgwl	21,203	$3.97	$84,132
20 to 500 emp. lgwl	1,638	$3.97	$6,500
Sub-total	22,841		$90,631
>500 emp. no lgwl	933	$3.97	$3,702
>500 emp. lgwl	312	$3.97	$1,238
Sub-total	1,245		$4,940
Total	31,597		$125,375

[a] Source: Table IV-96. (Estimates for MMUs in mines employing fewer than 20 workers and non-longwall MMUs in mines employing 20 to 500 workers are 96 percent of figures in Table IV-96.)

[b] Source: Table IV-15.

Proposed §70.215
Annual Cost Savings Related to Posting Fewer Sample Results, Due to the Elimination of Operator Bi-monthly Sampling

After processing samples sent to MSHA, the Agency sends the sampling results to the affected operator. The operator is required to post the one page sample results. Eliminating bi-monthly sampling means that operators would no longer have to post sample results 6 times per year.

Table IV-99 shows, by size category, the annual amount of reduced posting that would occur due to the elimination of operator bi-monthly sampling.

Table IV-99:
Annual Reduction in
the Number of Times Posting Occurs Due to
the Elimination of Operator Bi-monthly Sampling

Ug. Coal Size category	Annual Reduction in the No. of Times to Post Sample Results [a]
<20 emp.	1,200
20 to 500 emp. no lgwl	3,360
20 to 500 emp. lgwl	252
Sub-total	3,612
>500 emp. no lgwl	138
>500 emp. lgwl	48
Sub-total	186
Total	4,998

[a] Source: Table IV-21 (for each size group, MMUs under "first round" category are multiplied by 6 bi-monthly sampling periods).

After processing the samples, the Agency sends the sampling results to the affected operator. The operator is required to post the one page sample results. MSHA estimates that a clerical worker requires 0.1 hours (6 minutes) to copy and post the one page summary of the quarterly sample results. Photocopy costs are estimated to be $0.15 per page.

Table IV-100 shows, by size category, underground coal operators' annual cost savings from posting fewer sample results due to the elimination of operator bi-monthly sampling.

Table IV-100:
Annual Cost Savings Related to
Reduction in the Number of Times Posting Occurs
Due to the Elimination of Operator Bi-monthly Sampling

Ug. Coal Size Category	Annual Reduction in the No. of Times to Post Sample Results [a]	Cost Per Sample [b]	Annual Cost Savings
<20 emp.	1,200	$2.11	$2,530
20 to 500 emp. no lgwl	3,360	$2.11	$7,083
20 to 500 emp. lgwl	252	$2.11	$531
Sub-total	3,612		$7,614
>500 emp. no lgwl	138	$2.11	$291
>500 emp. lgwl	48	$2.11	$101
Sub-total	186		$392
Total	4,998		$10,536

[a] Source: Table IV-99.

[b] Source: Table IV-38.

Summary of Cost Savings Due to the Elimination of Operator Bi-Monthly Sampling

Table IV-101 presents, by size category, a summary of underground coal operators' annual cost savings that result from eliminating operator bi-monthly sampling.

Table IV-101:
Summary of Cost Savings Due to the Elimination of Operator Bi-monthly Sampling

Ug. Coal	Section 70	<20 emp. Annual Cost Savings	20 to 500 emp. Annual Cost Savings	>500 emp. Annual Cost Savings	Total Annual Cost Savings
Reduction in Operator Sampling [a]	215	$530,741	$1,520,022	$49,287	$2,100,050
Reduction in No Longer Competing Dust cards & Sending Cards & Samples to MSHA [b]	215	$29,804	$90,631	$4,940	$125,375
Reduction in Posting Samples [c]	215	$2,530	$7,614	$392	$10,536
Total		$563,074	$1,618,267	$54,620	$2,235,961

[a] Source: Table IV-97.

[b] Source: Table IV-98.

[c] Source: Table IV-100.

Cost Savings Related to Mine Closures

When a mine is forced to close due to an MSHA mine closure order, the production of coal is delayed and the mine equipment sits idle, while many functions of running the mine (such as ventilating the mine) continue to occur. The duration of an MSHA-ordered mine closure is not specified, but will last until the mine hazard that is the cause of the closure order is addressed by the operator. Under the proposed rule, operators of longwall MMUs who have exhausted the use of all feasible engineering controls to comply with the applicable coal mine dust standard would be able to use PAPRs. The Agency anticipates that the availability of PAPRs for compliance purposes under these circumstances would eliminate the occurrence of MSHA–ordered mine closures at longwall mines.

MSHA has reviewed the underground coal mine closures for calendar year 2001. These data show that one underground coal mine, employing between 20 to 500 workers, received a closure citation for a longwall MMU. The underground coal mine was closed for a period of 16 hours. In calendar year 2001, no underground coal mine closure of a longwall MMU occurred in any other mine size category. Therefore, annually, MSHA assumes that the proposed rule would prevent one longwall MMU at an underground coal mine employing 20 to 500 workers from being closed due to a closure order.

MSHA Office of Coal Safety and Health estimates that a longwall MMU would produce about 8,000 tons per shift, or 16.7 tons per minute. At a price of $25 per ton for coal from a longwall mine,[55] the lost revenues per minute of production for a longwall MMU would be $417. When the mine is forced to close due to a closure order, the production is not lost; it is just delayed. The delayed coal production would be made up at the end of the mine's life. MSHA has estimated that the average remaining life of a longwall MMU at a mine to be approximately 10 years. Therefore, savings from reduced mine closure orders related to production revenues would be equal to the production revenues initially lost minus the present value of the delayed production revenues. These net savings are just equal to the production revenues multiplied by 0.492,[56] to arrive at $205 ($417 x 0.492).

MSHA's Office of Coal Safety and Health estimates that the variable costs (labor, rental equipment, energy costs, etc…) on a longwall MMU would equal about 50 percent of revenues. The additional costs arising from a mine closure order would be equal to the variable costs of the delayed production. Thus, the variable costs (savings) of the delayed production (avoided)

[55] U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, Table 83, pg. 209, January 2002.

[56] $0.492 = 1 - 1/(1.07)^{10}$, where 1.07 is the annual discount rate.

would be equal to about $208 per minute.[57] Since these delayed production costs would not be incurred for approximately 10 years, they must be multiplied by a 10 year discounted present value factor of 0.508,[58] to arrive at $106 ($208 x 0.508).

The cost saving per minute of a prevented mine closure is therefore estimated to be $311 ($205 + $106). This cost saving per minute of a prevented mine closure must be multiplied by 60 minutes and 16 hours to arrive at the annual cost savings arising from prevented mine closures due to the proposed PV rule.[59] Table IV-102 shows, by size category, underground coal operators' cost savings from avoiding an MSHA order to close due to the proposed PV rule.

[57] Over time, as an operator becomes aware that the mine will not open any time soon, the operator would take steps to minimize losses by reducing mining operations and related variable costs to the minimum level allowed by law. Therefore, as a mine closure extended into days, weeks, and months, the $208 per minute cost of production would be expected to decline.

[58] $0.508 = 1/(1.07)^{10}$, where 1.07 is the annual discount rate.

[59] A longwall operator provided information to MSHA's Office of Coal Safety and Health that closure of an MMU caused by an MSHA mine closure order would cost between $435 and $809 per minute, or an average of $622 per minute. This figure is almost identical to our undiscounted estimate of $625 per minute ($417 + $208).

Table IV-102:
Annual Cost Savings Related to
Avoiding a Mine Closure Order

(a)	(b)	(c)	(d)	(e)
Ug. Coal Size Category	Annual No. of Mines Closing Due to a Mine Closure Order	Discounted Cost of Delayed Production Per Minute[a]	Minutes Saved [b]	Net Present Value of Annual Cost Savings [c]
<20 emp.	0	$311	0	$0
20 to 500 emp. no lgwl	0	$311	0	$0
20 to 500 emp. lgwl	1	$311	960	$298,400
Sub-total				$298,400
>500 emp. no lgwl	0	$311	0	$0
>500 emp. lgwl	0	$311	0	$0
Sub-total				$0
Total				$298,400

[a] $311 = [(8,000/480) x $25 x 0.492] + [0.5 x (8,000/480) x $25 x 0.508], where 8,000 is the tons produced per longwall MMU per shift, 480 is the number of minutes per shift, $25 is the cost per ton of longwall MMU coal, 0.492 is the discount adjustment for delayed revenues, 0.5 is the magnitude of longwall MMU variable costs relative to revenues, and 0.508 is the discount factor for delayed production costs.

[b] 960 = 60 x 16, where 60 is the number of minutes in a hour and 16 is the average number of hours of mine closure prevented annually due to the proposed rule.

[c] Col. c x col. d.

COST SAVINGS RELATED TO THE BLACK LUNG PROGRAM

As previously noted in Chapter III of this PREA, one of the benefits of reduced overexposures to respirable coal mine dust resulting from the proposed SS and PV rules would be an incremental decline in the number of Black Lung Program cases over time. A large proportion of this decline would translate into cost savings for coal operators.

In 1980, the Black Lung Program estimated that average lifetime payouts borne by responsible operators for each married miner in the program was about $248,700 dollars, assuming a 7 percent annual rate of increase;[60] that sum is equivalent to $534,524 per case in 2001 dollars.[61] Because of a change in the Black Lung Program in 1981, whereby survivors of miners in the Black Lung Program no longer automatically qualify for Black Lung survivor benefits, the average lifetime payout for each married miner has been reduced by about four percent.[62] In 2001 dollars, the current average payout for each married miner is therefore $513,143. As MSHA estimated in Chapter III of this PREA, over a 45 year working life, approximately 42 cases of simple CWP and PMF would be prevented as a result of the proposed SS and PV rules. That is equivalent to approximately 0.93 cases per year. In fiscal year 2000, 71 percent of the 386 claims for black lung benefits accepted as new cases were the financial responsibility of coal operators.[63] For these cases, operators paid either by being self-insured or through premiums paid to insurance companies.[64] If the 71 percent figure were applied to the 0.93 cases per year prevented by the proposed SS and PV rules, then these proposed rules would eliminate coal operators' financial obligations for approximately 0.66 black lung cases per year.

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[60]U. S. Department of Labor, Employment Standards Administration (1986), Estimated Average Total Cost of Future Monthly Benefits for Trust Fund and Responsible Operator Claims (approved in 1980), page 9.

[61]As determined by the Bureau of Labor Statistics (BLS), the Consumer Price Index (CPI) for all urban consumers, all items, rose from 82.4 in 1980 to 177.1 in 2001, an increase of about 115 percent. U. S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers, (web site: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt).

[62] In 1980, when all survivors of miners in the Black Lung Program qualified for survivor benefits, those survivor benefits were equal to about 11 percent of all Black Lung benefits. Starting in 1981, survivor benefits have been approved only for cases in which the miner's death was causally related to black lung. Since 1981, survivor benefits have been approved for about 62 percent of cases in which there was a survivor. Telephone communication on October 16, 2002 with James DeMarce, Director, Coal Mine Workers' Compensation, Office of Workers' Compensation Programs, Employment Standards Administration, U.S. Department of Labor.

[63]U.S. Department of Labor, Office of Workers' Compensation Programs 2000 Report, Pg. 52.

[64] The remaining 29 percent of claims were paid out of the Black Lung Disability Trust Fund. Approximately 51 percent of the Black Lung Disability Trust Fund is financed by a coal excise tax paid by mine operators (U.S. Department of Labor, Office of Workers' Compensation Programs 2000 Report, Funding and Disbursements of the Black Lung Disability Trust Fund, page 57). Hence for the remaining 29 percent of claims, about 51 percent is paid by coal mine operators. However, since the financing of the trust fund, which is set by formula, would probably not be modified in response to the 0.93 reduced cases in the Black Lung Program resulting from the proposed SS and PV rules, no cost savings have been estimated for the coal excise tax paid by coal mine operators.

As shown in Table IV-103, that amount is equivalent to $338,674 ($513,143 x 0.66) in 2001 dollars. These cost savings are apportioned by mine size categories in Table IV-103 on the basis of the relative number of prevented cases of simple CWP and PMF, by mine size class, for affected DOs and affected NDOs.[65]

To the extent that we have underestimated the magnitude of overexposures to respirable coal mine dust, it is likely that more Black Lung Program cases would be prevented than we have estimated. In that case, the cost savings to operators for payments to the Black Lung Program due to the proposed rules are likely to be larger than we have estimated.

Table IV-103:
Total Annual Cost Savings Related to Black Lung Benefits

Mine Size	< 20 emp.	20 to 500 emp.	>500 emp.	Total
Share of Annual Black Lung Savings	15%	79%	6%	100%
Annual Black Lung Savings	$50,801	$267,552	$20,320	$338,674

[65] As derived from Table III-1 through Table III-3, for coal mines with fewer than 20 employees, the proposed SS and PV rules would prevent CWP or PMF for approximately 3.17 DO cases , 1.79 NDO cases, and 1.75 RB-DA cases. For coal mines with between 20 and 500 employees, the proposed SS and PV rules would prevent CWP or PMF for approximately 17.51 DO cases, 9.87 NDO cases, and 5.51 RB-DA cases. For coal mines with more than 500 employees, the proposed SS and PV rules would prevent CWP or PMF for approximately 1.32 DO cases, 0.74 NDO cases, and 0.22 RB-DA cases.

Net Cost of Proposed PV Rule

Table IV-104 shows, by size category, underground coal operators' net cost of the proposed PV rule. Table IV-104 subtracts the cost to implement the proposed PV rule from the cost savings that would result from the proposed PV rule. Table IV-104 does not included the penalty cost savings associated with the proposed PV rule. The penalty cost savings associated with the proposed PV rule are shown in Table IV-95.

Table IV-104:
Summary of the Net Costs to Operators of Proposed PV Rule (Cost Increases minus PV Cost Reductions)
(Excludes Penalty Cost Savings) *

	<20 emp.				20 to 500 emp.				>500 emp.				Total			
Ug. Coal PV Rule	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs	Adj. First Year Costs	Annual-ized Costs	Annual Costs	Yearly Costs
Cost Increases [a]	$1,066,888	$85,808	$345,109	$430,916	$6,990,666	$539,678	$2,950,719	$3,490,398	$812,605	$61,781	$566,695	$628,476	$8,870,159	$687,266	$3,862,523	$4,549,789
Cost Savings																
Reduced Citations & Elimination of Abatement Sampling [b]	-$122,214	-$8,555	$510,717	$502,162	-$749,817	-$52,487	$3,208,690	$3,156,203	-$18,726	-$1,311	$119,130	$117,819	-$890,757	-$62,353	$3,838,537	$3,776,184
Elim. Operator Bi-monthly Sampling [c]	$0	$0	$563,074	$563,074	$0	$0	$1,618,267	$1,618,267	$0	$0	$54,620	$54,620	$0	$0	$2,235,961	$2,235,961
Reduced Mine Closures [d]	$0	$0	$0	$0	$0	$0	$298,400	$298,400	$0	$0	$0	$0	$0	$0	$298,400	$298,400
Black Lung Savings [e]	$0	$0	$50,801	$50,801	$0	$0	$267,552	$267,552	$0	$0	$20,320	$20,320	$0	$0	$338,674	$338,674
Total Savings	-$122,214	-$8,555	$1,124,592	$1,116,037	-$749,817	-$52,487	$5,392,909	$5,340,422	-$18,726	-$1,311	$194,070	$192,760	-$890,757	-$62,353	$6,711,572	$6,649,219
Net PV Rule Costs	$1,189,102	$94,363	-$779,484	-$685,121	$7,740,483	$592,166	-$2,442,190	-$1,850,024	$831,331	$63,091	$372,625	$435,716	$9,760,916	$749,619	-$2,849,049	-$2,099,429

*** For summary of penalty cost savings resulting from the PV rule see Table IV-95.**

[a] Source: Table IV-81.

[b] Source: Table IV-90.

[c] Source: Table IV-101.

[d] Source: Table IV-102.

[e] Source: Table IV-103.

FEASIBILITY

As discussed in section XII of the preamble of the proposed SS rule and in section VIII of the preamble of the proposed PV rule, MSHA has concluded that the requirements of the proposed rules, both separately and in combination, are technologically and economically feasible.

The Proposed SS Rule

MSHA, in consultation with NIOSH, believes that compliance with the proposed SS rule would be technologically feasible for the mining industry. The SS rule would predominantly affect MSHA's procedures since MSHA alone conducts inspector sampling. However, due to the promulgation of the SS rule, some operators would experience a slight increase in the number of abatement samples they would conduct using current technology. After the promulgation of the proposed SS rule, coal operators would continue to comply with the existing respirable dust concentration limit of 2.0 mg/m^3. Such compliance with the applicable standard has proven feasible over the years. Furthermore, a compliance determination based on an MSHA single- shift result was found to be technologically feasible during the prior effective Interim Single-Sample Enforcement Policy (ISSEP), in effect from March 2, 1998 through September 4, 1998.

MSHA has traditionally used a revenue screening test—whether the yearly costs of a regulation equal or exceed one percent of revenues—to determine whether the regulation might possibly be economically infeasible for industry to comply with.[66] On that basis, MSHA, in consultation with NIOSH, believes that the SS rule would be economically feasible for the coal mining industry. As previously estimated in this chapter, the coal mining industry would incur costs of approximately $3.1 million yearly to comply with the proposed SS rule. Coal operators would also incur approximately an additional $1.7 million yearly in penalty costs associated with the additional citations arising from the proposed SS rule. That the total $4.8 million borne yearly by the coal mining industry as a result of the proposed SS rule is well less than 1 percent (about 0.03 percent) of the industry's yearly revenues of $17.7 billion provides convincing evidence that the proposed rule is economically feasible.

[66] The Agency recognizes the theoretical usefulness of evaluating the effects of a regulation on profits (rather than on revenues). MSHA is currently investigating the future use of profitability analysis to evaluate the economic feasibility of its rules. However, given that the yearly costs of the joint SS/PV rules are less than 0.01 percent of yearly industry revenues, MSHA is confident that, given the selection and use of any reasonable profitability test, the joint SS/PV rules would be found to be economically feasible.

The Proposed PV Rule

In designing the proposed PV rule for underground coal mines, MSHA has taken into account its experience and that of the operators to ensure that the rule provides additional protection from occupational exposure to respirable coal mine dust using current compliance technology (while encouraging technological improvements). For this reason, MSHA believes the proposed PV rule is technologically feasible. MSHA requires underground coal operators to utilize all feasible engineering or environmental controls, which are specified in the mine ventilation plan, to maintain concentrations of respirable dust in the work environment of MMUs at or below the applicable dust standard. Operators therefore would not be required to implement engineering or environmental controls that were not technologically feasible.

Based on its vast experience in the sampling of respirable dust levels in the MMU work environment, MSHA believes that technology is currently available to control respirable dust to levels at or below the applicable level at MMUs employing continuous and conventional methods of mining. In those cases where operators have trouble in meeting MSHA's respirable dust standard and have exhausted all feasible engineering and environmental controls, the Agency would allow the use of administrative controls or powered air-purifying respirators (PAPRs), until other feasible controls become available.

MSHA believes that the proposed PV rule would be economically feasible for the underground coal mining industry. The proposed PV rule would result in net compliance cost savings of approximately $2.1 million yearly. (Although implementing the proposed PV rule would cost about $4.5 million yearly, there would be offsetting yearly savings of about $3.8 million from reduced citations and the elimination of operator abatement sampling; $2.2 million from the elimination of operator bi-monthly sampling requirements; $0.3 million resulting from the elimination of delayed production due to mine closure orders; and $0.3 million from reduced payouts by operators for black lung cases.) Underground coal operators would also obtain a yearly cost savings of approximately $3.0 million in reduced penalty costs associated with the reduction in operator citations arising from the proposed PV rule. The proposed PV rule would therefore provide a total yearly cost savings to operators (including net reduced penalty costs) of $5.1 million to the underground coal mining industry.

Economic Feasibility of the Proposed SS and PV Rules in Combination

MSHA believes that the combination of the proposed SS and PV rules would be economically feasible for the underground and surface coal mining industries. The underground coal mining industry would incur costs of approximately $3.1 million yearly to comply with the applicable coal mine dust standard under the proposed SS rule. Underground coal operators would incur approximately an additional $1.7 million yearly in penalty costs associated with the additional citations arising from the proposed SS rule. Because of the proposed PV rule, underground coal mines would incur net compliance cost savings of approximately $2.1 million

and, in addition, obtain yearly cost savings of approximately $3.0 million in reduced penalty costs associated with the reduction in operator citations. Thus, the proposed SS and PV rules in combination would impose a net cost savings (including penalty costs and penalty cost savings) on the underground coal mining industry of about $0.3 million yearly. MSHA therefore concludes that these proposed rules are economically feasible for the underground coal mining industry.

The surface coal mining industry is covered by the proposed SS rule but not by the proposed PV rule. The surface coal mining industry would incur costs of approximately $57,000 annually to comply with the proposed SS rule. In addition, surface coal operators would incur approximately an additional $14,000 in penalty costs associated with the additional citations arising from the proposed SS rule. Thus, the total cost to the surface coal mining industry of the proposed SS and PV rules in combination (recalling that this industry is not covered by the PV rule) would be about $71,000 yearly, which is well less than 1 percent (about 0.001 percent) of yearly industry revenues of $11.7 billion. Therefore, MSHA concludes that the proposed SS and PV rules are economically feasible for the surface coal mining industry.

V. REGULATORY FLEXIBILITY CERTIFICATION

INTRODUCTION

Pursuant to the Regulatory Flexibility Act of 1980 as amended, MSHA has analyzed the impact of the proposed SS and PV rules on small businesses. Further, MSHA has made a determination with respect to whether or not the Agency can certify that these proposed rules would not have a significant economic impact on a substantial number of small entities that are covered by these rulemakings. Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA must include in the rules a factual basis for this certification. If the proposed rules have a significant economic impact on a substantial number of small entities, then the Agency must develop an initial regulatory flexibility analysis.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a proposed rule on small entities, MSHA must use the SBA definition for a small entity or, after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the Federal Register for notice and comment. MSHA has not taken such an action, and hence is required to use the SBA definition.

The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees (13 CFR 121.201). Almost all of the coal mines affected by these rulemakings fall into this category and hence can be viewed as sharing the special regulatory concerns which the RFA was designed to address.

Traditionally, the Agency has also looked at the impacts of its proposed rules on a subset of mines with 500 or fewer employees—those with fewer than 20 employees, which the mining community refers to as "small mines." These small mines differ from larger mines not only in the number of employees, but also, among other things, in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, their costs of complying with MSHA rules and the impact of MSHA rules on them would also tend to be different. It is for this reason that "small mines," as traditionally defined by the mining community, are of special concern to MSHA.

This analysis complies with the legal requirements of the RFA for an analysis of the impacts on "small entities" while continuing MSHA's traditional look at "small mines." MSHA concludes that it can certify that the proposed SS and PV rules would not have a significant economic impact on a substantial number of small entities that are covered by these rulemakings. The Agency has determined that this is the case both for mines affected by these rulemakings

with fewer than 20 employees and for mines affected by these rulemakings with 500 or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach

The Agency's analysis of impacts on "small entities" begins with a "screening" analysis. The screening compares the estimated compliance costs of a proposed rule for small entities in the sector affected by the rule to the estimated revenues for those small entities. When estimated compliance costs are less than 1 percent of the estimated revenues, or they are negative (that is, they provide a net cost savings), the Agency believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. When estimated compliance costs exceed 1 percent of revenues, it tends to indicate that further analysis may be warranted.[67]

Derivation of Costs and Revenues

The compliance costs noted in this chapter were previously presented in Chapter IV of this document along with an explanation of how they were derived. All underground and surface coal mines are affected by the proposed SS rule. However, only underground coal mines are affected by the proposed PV rule.

In determining revenues for underground and surface coal mines, MSHA multiplied their production data (in tons) by the estimated price per ton of the commodity ($16.78 per ton in 2000). The production data were obtained from MSHA-PEIR data[68] and the price estimates were obtained from the Department of Energy.[69]

Results of Screening Analysis

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[67] MSHA has traditionally used a revenue screening test—whether the yearly costs of a regulation equal or exceed 1 percent of revenues—to determine whether the regulation might possibly have a significant economic impact on a substantial number of small entities. The Agency recognizes the theoretical usefulness of evaluating the effects of a regulation on profits (rather than on revenues). MSHA is currently investigating the future use of profitability analysis to evaluate whether its rules would have a significant impact on a substantial number of small entities. However, given that the yearly costs of the joint SS/PV rules are less than 0.01 percent of yearly industry revenues for any subset of small mines, MSHA is confident that, given the selection and use of any reasonable profitability test, the joint SS/PV rules would be found not to have a significant economic effect on a substantial number of small entities.

[68] MSHA - PEIR, Calendar Year 2000 data.

[69] U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, Table 80, p. 206.

The proposed SS rule applies to all underground and surface coal mines. Table V-1 shows that the estimated yearly cost of the proposed SS rule as a percentage of yearly revenues is about 0.2 percent for underground coal mines with fewer than 20 employees and less than 0.01 percent for surface coal mines with fewer than 20 employees. The estimated yearly cost of the proposed SS rule as a percentage of yearly revenues is about 0.05 percent for underground coal mines with 500 or fewer employees and less than 0.01 percent for surface coal mines with 500 or fewer employees.

TABLE V-1: Estimated Yearly Costs of Proposed SS Rule Relative to Yearly Revenues for Underground and Surface Coal Mines (dollars in thousands)

Mine Size	Mine Type	SS Rule Yearly Costs [a]	Revenues [b]	Costs as Percentage of Revenues
< 20 emp.	Underground	$417	$201,700	0.2%
	Surface	$22	$384,706	< 0.01%
≤ 500 emp.	Underground	$2,920	$5,644,194	0.05%
	Surface	$57	$9,448,936	< 0.01%

[a] Estimated yearly costs are composed of annual costs only. There are no first year costs or annualized costs in the SS rule.

[b] Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, 2000 PEIR data; and U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p. 206.

The proposed PV rule applies only to underground coal mines. Table V-2 shows that for underground coal mines with fewer than 20 employees the proposed PV rule provides a net yearly cost savings (combining net annualized costs and net annual costs) of about $0.685 million. For underground coal mines with 500 or fewer employees, the proposed PV rule provides a net yearly cost savings of about $2.535 million.

TABLE V-2: Estimated Yearly Costs of Proposed PV Rule Relative to Yearly Revenues for Underground Coal Mines (dollars in thousands)

Mine Size	PV Rule Net Yearly Costs[a]	Underground Coal Mine Revenues[b]	Costs as Percentage of Revenues
< 20 emp.	**($685)**	**$201,700**	**N/A**
≤500 emp.	**($2,535)**	**$5,644,194**	**N/A**

[a] Estimated yearly costs are composed of "adjusted" first year costs that have been annualized plus annual costs.

[b] Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, 2000 PEIR data; and U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p. 206.

Table V-3 shows the combined yearly costs of the proposed SS and PV rules relative to yearly revenues for small underground and surface coal mines. For both underground and surface coal mines, the estimated yearly cost of the rules as a percentage of yearly revenue is less than 0.01 percent for coal mines with fewer than 20 employees and for those with 500 or fewer employees.

TABLE V-3: Estimated Combined Yearly Costs of Proposed SS and PV Rules Relative to Yearly Revenues for Underground and Surface Coal Mines (dollars in thousands)

Mine Size	Mine Type	SS and PV Rules Yearly Costs [a]	Revenues [b]	Costs as Percentage of Revenues
< 20 emp.	Underground	($268)	$201,700	N/A
	Surface	$22	$384,706	< 0.01%
≤500 emp.	Underground	$385	$5,644,194	<0.01%
	Surface	$57	$9,448,936	< 0.01%

[a] Estimated yearly costs for the PV rule are composed of annualized costs plus annual costs. However, yearly costs for the SS rule consist only of annual costs because there are no first year annualized costs in the SS rule.

[b] Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, 2000 PEIR data; and U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p. 206.

Using both definitions of small mines, one with fewer than 20 employees and one with 500 or fewer employees, the estimated compliance costs of the proposed rules are either negative or substantially less than 1 percent of estimated coal revenues, well below the level suggesting that they might have a significant economic impact on a substantial number of small entities. Accordingly, MSHA has certified that these proposed rules would not have a significant economic impact on a substantial number of small entities that are covered by these proposed rules.

MSHA has consulted with the Chief Counsel for Advocacy on the PV and SS proposed rules and on the Agency's certification of no significant economic impact on a substantial number of small entities covered by these rules. Consistent with Agency practice, notes of any meetings with the Chief Counsel's office on these rules, or any written communications, will be placed in the rulemaking record.

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT

MSHA has determined that, for purposes of §202 of the Unfunded Mandates Reform Act of 1995, the SS and PV proposed rules do not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments, or increased expenditures by the private sector of more than $100 million. Moreover, the Agency has determined that, for purposes of §203 of the Act, these proposed rules would not significantly or uniquely affect small governments.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 requires each Federal agency to consider the environmental effects of final actions and to prepare an Environmental Impact Statement on major actions significantly affecting the quality of the environment. MSHA has reviewed the proposed SS and PV rules in accordance with NEPA requirements (42 U.S.C. 4321 *et. seq.*), the regulations of the Council of Environmental Quality (40 CFR Part 1500), and the Department of Labor's NEPA procedures (29 CFR Part 11). As a result of this review, MSHA has determined that these proposed rules would have no significant environmental impact.

EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS

These proposed rules are not subject to Executive Order 12630, Government Actions and Interference with Constitutionally Protected Property Rights, because they do not involve implementation of a policy with takings implications.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The Agency has reviewed Executive Order 12988, Civil Justice Reform, and determined that the proposed SS and PV rules would not unduly burden the Federal court system. The proposed rules have been written so as to provide a clear legal standard for affected conduct and have been reviewed carefully to eliminate drafting errors and ambiguities.

EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

In accordance with Executive Order 13045, MSHA has evaluated the environmental health and safety effects of the proposed SS and PV rules on children. The Agency has determined that the proposed rules would not have an adverse impact on children.

EXECUTIVE ORDER 13132: FEDERALISM

MSHA has reviewed the proposed SS and PV rules in accordance with Executive Order 13132 regarding federalism and has determined that they would not have any federalism implications. The proposed rules would not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

MSHA has determined that the SS and PV proposed rules would not impose substantial direct compliance costs on Indian tribal governments.

EXECUTIVE ORDER 13211: ACTIONS CONCERNING REGULATIONS THAT SIGNIFICANTLY AFFECT ENERGY SUPPLY, DISTRIBUTION, OR USE

In accordance with Executive Order 13211, the Agency has reviewed the SS and PV proposed rules for their energy impacts. The rules would have no effect on the distribution or use of energy. The only impacts of the rule on the supply of energy would be through their effect on the price of coal or the production of coal.

The proposed rules would have no direct effects on the production of coal. The rules would not prevent the mining of particular coal deposits; nor would the rules require coal deposits to be mined at a slower pace. The only impacts of the rules on coal mine production would be indirect, via the cost or price of coal.

The estimated yearly cost of the proposed rules (excluding penalty costs) for the coal mining industry is approximately $0.98 million.[70] The annual revenues of the coal mining industry in 2000 were approximately $17.7 billion.[71] The cost of the rule for the coal mining

[70] Estimate obtained from Table IV-1.

[71] Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on PEIR data; and U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p.206.

industry is therefore equal to less than 0.01 % of revenues. Even if we were to assume that increased cost caused by the rule would be fully reflected in coal prices, the impact would be negligible.

Accordingly, the Agency has determined that the SS and PV rules would have no significant adverse effect on the supply, distribution, and use of energy.

EXECUTIVE ORDER 13272: PROPER CONSIDERATION OF SMALL ENTITIES IN AGENCY RULEMAKING

In accordance with Executive Order 13272, MSHA has thoroughly reviewed the SS and PV proposed rules to assess and take appropriate account of their potential impact on small businesses, small governmental jurisdictions, and small organizations. As discussed in Chapter V of this PREA, MSHA has determined that the proposed rules would not have a significant economic impact on a substantial number of small entities.

VII. PAPERWORK REDUCTION ACT of 1995

INTRODUCTION

The purpose of this chapter is to show the burden hours and related costs which would be borne by underground and surface coal operators as a result of the proposed SS and PV rules. The costs in this chapter have already been derived in Chapter IV of this PREA. However, in this chapter, costs are estimated only in relation to the burden hours that the proposed rules impose on operators and miners. Therefore, not all costs derived in Chapter IV appear below. Those costs derived in Chapter IV which do not have burden hours related to them do not appear in this chapter.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

The proposed PV rule has first year burden hours (those that occur only in the first year) and annual burden hours which occur in the first year and every year thereafter. Only underground coal mines have paperwork provisions under the proposed PV rule.

The handling of some types of proposed PV burden hours and costs requires explanation. In a few cases, the proposed PV rule imposes burden hours and costs that would be the same every year, beginning with the first year that the rule takes effect. These are annual burden hours and costs, as traditionally defined. In most cases, however, the proposed PV rule imposes burden hours and costs which would be the same each year starting with the second year the PV rule is in effect, but whose first year burden hours and costs would be different. MSHA transformed these first year burden hours and costs and annual burden hours and costs starting in Year 2 into adjusted first year burden hours and costs (first year burden hours and costs minus an amount equal to annual burden hours and costs starting with Year 2 after the rule takes effect) and true annual burden hours and costs starting in Year 1 after the rule takes effect.[72]

[72] A hypothetical example might help to explain this procedure. Suppose that burden costs are $2,000 the first year and $400 each year thereafter. The adjustment procedure simply splits first year burden costs into two parts: (1) $400, for the first year of annual burden costs; and (2) the residual $1,600. Consequently, adjusted first year burden costs would be $1,600 and annual burden costs (starting in year 1) would be $400.

Proposed Single Sample Rule

Surface Coal Mine Operators

Table VII-1 shows that in the first year the SS rule is in effect, and for every year thereafter, there would be an increase of 323 burden hours and a related cost increase of $9,278.

Underground Coal Mine Operators

Table VII-1(a) shows that in the first year the SS rule is in effect, and for every year thereafter, there would be an increase of 5,354 burden hours and a related cost increase of $142,690.

Proposed PV Rule

Surface Coal Mine Operators

Surface coal mine operators are not affected by the proposed PV rule.

Underground Coal Mine Operators

In the First Year of the Proposed PV Rule

In the first year the proposed PV rule is in effect, there would be a net decrease of 34,929 burden hours and net cost savings of $704,474. Table VII-2 shows that with respect to first year-only burden hours and costs, there would be an increase of 7,609 burden hours and related costs of $371,273. Table VII-2(a) shows that with respect to every year that the proposed PV rule is in effect (including the first year), there would be a net decrease of 42,538 burden hours and net cost savings of $1,075,747.

In the Second Year of the Proposed PV Rule and for Every Year Thereafter

After the first year of the proposed PV rule, those burden hours and related costs occurring only in the first year would no longer occur, and what remains are only the annual burden hours and related costs. Therefore, in the second year of the proposed PV rule and for every year thereafter, there would be a net decrease of 42,538 burden hours and a related cost decrease of $1,075,747.

Combined SS and PV Rule

For Surface Coal Mine Operators

First Year, and Every Year Thereafter, of the SS and PV Rules

Only the SS rule provides paperwork burden for surface coal mine operators. Table VII-1 shows that in the first year the SS rule is in effect, and for every year thereafter, there would be an increase of 323 burden hours and a related cost increase of $9,278.

For Underground Coal Operators

First Year of the SS and PV Rule

In the first year of the SS and PV rules, there would be a net decrease of 29,575 burden hours and an associated net cost increase of $561,784. Table VII-1(a) shows that in the first year the SS rule is in effect, and for every year thereafter, there would be a increase of 5,354 burden hours and a related cost increase of $142,690. Table VII-2 shows that with respect to first year-only burden hours and costs for the PV rule, there would be an increase of 7,609 burden hours and costs of $371,273. Table VII-2(a) shows that with respect to every year that the proposed PV rule is in effect (including the first year), there would be a net decrease of 42,538 burden hours and net cost savings of $1,075,747. Therefore, combining both rules shows that underground coal mine operators would have a net decrease of 29,575 burden hours [5,354 + (7,609-42,538)] and a related net cost increase of $561,784 [$142,690 + ($371,273 - $1,075,747)] .

Second Year, and Every Year Thereafter, of the SS and PV Rule

The PV rule's first year only burden hours of 7,609 and related cost increase of $371,273 would not occur in the second year, and every year thereafter. Therefore, in the second year, and every year thereafter, the SS and PV rules shows a net decrease of 37,184 [5,354 + (-42,538)] burden hours and an associated net cost savings of $933,057 [$142,690 + (-$1,075,747)].

Table VII-1:
Summary of Annual Burden Hours and Costs
For Surface Coal Mine Operators
For the Proposed SS Rule

	<20 emp.		20 to 500 emp.		>500 emp.		Total	
Table	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs
VII-3	11	$577	27	$1,483	0	$0	38	$2,060
VII-4	4	$82	5	$106	0	$0	10	$188
VII-5	5	$103	7	$132	0	$0	12	$235
VII-6	105	$2,707	135	$3,480	0	$0	240	$6,187
VII-7	7	$187	12	$327	0	$0	19	$515
VII-8	2	$41	3	$53	0	$0	5	$94
Increase	134	$3,697	189	$5,581	0	$0	323	$9,278

Table VII-1(a):
Summary of Annual Burden Hours and Costs
For Underground Coal Mine Operators
For the Proposed SS Rule

	<20 emp.		20 to 500 emp.		>500 emp.		Total	
Table	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs
VII-3	12	$659	158	$8,677	6	$330	176	$9,666
VII-4	5	$94	32	$619	1	$23	38	$736
VII-5	6	$117	40	$773	2	$29	47	$920
VII-6	640	$16,498	3,655	$94,220	170	$4,382	4,465	$115,100
VII-7	77	$2,069	441	$11,877	21	$573	539	$14,519
VII-8	13	$251	73	$1,431	3	$67	89	$1,748
Increase	752	$19,689	4,398	$117,597	203	$5,404	5,354	$142,690

Table VII-2:
Summary of Net Burden Hours and Costs in First Year Only For Underground Coal Mine Operators
For the Proposed PV Rule

		<20 emp.			20 to 500 emp.			>500 emp.			Total		
Detail	Table	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized
Increase	VII-45	1,459	$71,334	$6,404	5,736	$280,093	$26,185	413	$19,846	$1,962	7,609	$371,273	$34,551

Table VII-2(a):
Summary of Annual Burden Hours and Costs For Underground Coal Mine Operators
For the Proposed PV Rule

		<20 emp.		20 to 500 emp.		>500 emp.		Total	
Detail	Table	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs
Increase	VII-48	450	$16,113	1,488	$54,803	84	$3,181	2,022	$74,098
Reduction [a]	VII-52	8,883	$229,336	26,940	$695,564	1,419	$36,651	37,242	$961,552
Reduction [b]	VII-56	1,049	$27,051	6,011	$155,040	258	$6,646	7,317	$188,737
Net Increase		-9,482	-$240,274	-31,463	-$795,802	-1,593	-$40,116	-42,538	-$1,076,192

[a] Reduced operator sampling resulting from eliminating operator bi-monthly sampling.

[b] Reduced operator abatement sampling resulting from the elimination of operator abatement sampling in the PV rule.

In this chapter the following data are used:

- a certified dust technician's hourly wage rate of $19.95,
- a mine supervisor's hourly wage rate of $54.92,
- a clerical workers hourly wage rate of $19.58, and
- a coal miner's hourly wage rate of $28.07

Paperwork costs incurred by operators that do not have burden hours attached to them are not included in this chapter. An example of this type of paperwork cost is one in which an operator pays a contractor to write a program. In this case, since the operator does not write the program, the operator does not incur any burden hours. However, there is still a paperwork burden cost to the operator because the operator is still responsible for paying the contractor for the service, which is categorized as paperwork. The paperwork burden costs discussed above, along with the burden hours and costs in this chapter, are included in the OMB paperwork package that accompanies the proposed PV rule.

Discussed below are the paperwork provisions that occur as a result of the proposed PV rule. The proposed PV rule contains increased paperwork provisions.

SINGLE SAMPLE RULE PAPERWORK PROVISIONS FOR UNDERGROUND AND SURFACE COAL OPERATORS

Existing §§75.370(a)(1), 71.300(a) and 90.300(a) Burden Hours and Costs to Write or Revise Dust Control Plan Due to Additional Citations

As a result of the additional SS citations, some mine operators would be required to either revise their existing ventilation plans or develop or revise their dust control plans. Section 75.370 requires underground coal mine operators to have an approved mine ventilation plan prior to beginning production. Surface coal mine operators are generally allowed to operate without a dust control plan. However, §71.300 requires surface mine coal operators to have a respirable dust control plan applicable to the work position after abating a citation for excessive dust. Section 90.300 requires a coal operator who receives a part 90 citation to develop a respirable dust control plan for the part 90 miner after abating a citation.

For underground mines, MSHA estimates that the following additional SS citations would require that mine plans be revised or developed:

- 24 additional SS citations for operators employing fewer than 20 workers;
- 158 additional citations for operators employing 20 to 500 workers (of which 139 citations relate to non-longwall MMUs and the remaining 19 citations relate to longwall MMUs); and
- 6 additional SS citations for operators employing more than 500 workers (of which 5 citations relate to non-longwall MMUs and the remaining 1 citation relates to a longwall MMU.

For surface mines, MSHA estimates that the following additional SS citations would require that a dust control plan be developed or revised:

- 21 additional SS citations for operators employing fewer than 20 workers; and
- 27 additional citations for operators employing 20 to 500 workers.

On average, MSHA estimates that to develop or revise a dust control plan would take a mine supervisor approximately 0.5 hours (30 minutes) for operators employing fewer than 20 workers and 1 hour for operators employing 20 or more workers. Table VII-3 shows, by size category, surface and underground coal operators' annual burden hours and related costs to develop or revise a dust control plan.

Table VII-3: 75.370(a)(1), 71.300(a), and 90.300(a)
Annual Burden Hours and Costs to Revise or Develop
Dust Control Plans Due to Additional SS Citations

Size Category	No. of Additional SS Citations	Time Needed for Plans (in hrs.)	Annual Burden Hours	Superv. Wage Rate per hr.	Annual Burden Costs
Underground Coal Mines					
<20 emp.	24	0.5	12	$54.92	$659
20 to 500 emp. no lgwl	139	1	139	$54.92	$7,634
20 to 500 emp. lgwl	19	1	19	$54.92	$1,043
Sub-toal	158		158		$8,677
>500 emp. no lgwl	5	1	5	$54.92	$275
>500 emp. lgwl	1	1	1	$54.92	$55
Sub-total	6		6		$330
Total Underground			176		$9,666
Surface Coal Mines					
<20 emp.	21	0.5	10.5	$54.92	$577
20 to 500 emp.	27	1	27	$54.92	$1,483
>500 emp.	0	1	0	$54.92	$0
Total Surface			37.5		$2,060
Total			213.5		$11,725

Existing §§75.370(a)(2), 71.300(a), and 90.300(a)
Burden Hours and Costs to Send Dust Control Plans to MSHA Due to Additional Citations

A copy of the new or revised dust control plan would need to be sent to MSHA. The Agency estimates that a clerical worker would take 12 minutes (0.2 hours) to copy and send the plan to MSHA. The number of dust control plans to send to MSHA would be equal to the number of plans revised or developed, which is shown in Table VII-3. Table VII-4 shows, by size category, surface and underground coal operators' annual burden hours and related costs to send in a dust control plan.

Table VII-4: 75.370(a)(2), 71.300(a) and 90.300(a)
Annual Burden Hours and Costs to Prepare to Send
Dust Control Plan to MSHA Due to Additional SS Citations

Size category	No. of Additional SS Citations	Time to Copy and Send	Annual Burden Hours	Clerical Wage Rate (per hr.)	Total Annual Costs
Underground Coal Mines					
<20 emp.	24	0.2	4.8	$19.58	$94
20 to 500 emp. no lgwl	139	0.2	27.8	$19.58	$544
20 to 500 emp. lgwl	19	0.2	3.8	$19.58	$74
Sub-total	158		31.6		$619
>500 emp. no lgwl	5	0.2	1.0	$19.58	$20
>500 emp. lgwl	1	0.2	0.2	$19.58	$4
Sub-total	6		1.2		$23
Total Underground			37.6		$736
Surface Coal Mines					
<20 emp.	21	0.2	4.2	$19.58	$82
20 to 500 emp.	27	0.2	5.4	$19.58	$106
>500 emp.	0	0.2	0.0	$19.58	$0
Total Surface			9.6		$188
Total			47.2		$924

Existing §§75.370(a)(3(iii), 71.301(d), and 90.301(d)
Burden Hours and Costs to Post Plan Revisions or Provide Part 90 Miner With Copy of Plan, Due to Additional Citations

Section 75.370(a)(3)(iii) requires that underground coal mine operators post a copy of any changes to the mine ventilation plan on the mine bulletin board. Section 71.301(d) requires that surface coal operators post a copy of the current dust control plan on the mine bulletin board. Section 90.301(d) requires that the operator provide a copy of the current dust control plan to the affected part 90 miner. MSHA estimates that a clerical worker would require 0.25 hours (15 minutes) to copy and post a dust control plan. Table VII-5 shows, by size category, surface and underground coal operators' annual burden hours and related costs to post dust control plans.

Table VII-5: 75.370(a)(3)(iii), 71.301(d), and 90.301(d)
Annual Burden Hours and Costs to Post Mine Plan or
Provide Plan to Part 90 Mine, Due to Additional SS Citations

Size Category	No. of Additional SS Citations	Time to Copy and Post Plan	Annual Burden Hours	Clercial Wage Rate (in hrs.)	Annual Burden Costs
Underground Coal Mines					
<20 emp.	24	0.25	6.0	$19.58	$117
20 to 500 emp. no lgwl	139	0.25	34.8	$19.58	$680
20 to 500 emp. lgwl	19	0.25	4.8	$19.58	$93
Sub-total	158		39.5		$773
>500 emp. no lgwl	5	0.25	1.3	$19.58	$24
>500 emp. lgwl	1	0.25	0.3	$19.58	$5
Sub-total	6		1.5		$29
Total Underground			47.0		$920
Surface Coal Mines					
<20 emp.	21	0.25	5.3	$19.58	$103
20 to 500 emp.	27	0.25	6.8	$19.58	$132
>500 emp.	0	0.25	0.0	$19.58	$0
TotalSurface			12.0		$235
Total			59.0		$1,155

Existing §§70.201(d), 71.201(d) and 90.201(d)
Burden Hours and Costs of Abatement Sampling Due to Additional Citations

Under the proposed SS rule, when cited for excessive dust, the operator would be required to take corrective action and conduct abatement sampling to demonstrate compliance. Five abatement samples would be taken for each citation. On average, MSHA estimates that it takes approximately 1 hour to prepare the sampling device and perform the required checks during sampling. This time period includes 0.8333 hours (50 minutes) of a certified dust technician's time to prepare, disassemble, and clean the sampling unit after completion of sampling. In addition, it takes a mine supervisor 0.1666 hours (10 minutes) to make the required operational checks of the sampling device during the shift. The technician's hourly wage rate is $19.95 and the mine supervisor's hourly wage rate is $54.92.

Table VII-6 shows, by size category, surface and underground coal operators' annual burden hours and related costs to conduct abatement sampling.

Table VII-6: Existing 70.201(d), 71.201(d) and 90.201(d)
Annual Burden Hours and Cost to Conduct Abatement Sampling
Due to Additional SS Citations

Size category	No. of Additional SS Citations [a]	No. of Samples per SS Citation	Time to Sample [b]	Annual Burden Hours	Cost Per Sample[c]	Annual Burden Costs
Underground Coal Mines						
<20 emp.	128	5	1	640	$25.78	$16,498
20 to 500 emp. no lgwl	643	5	1	3,215	$25.78	$82,882
20 to 500 emp. lgwl	88	5	1	440	$25.78	$11,337
Sub-total	731			3,655		$94,220
>500 emp. no lgwl	30	5	1	151	$25.78	$3,887
>500 emp. lgwl	4	5	1	19	$25.78	$495
Sub-total	34			170		$4,382
Total Underground				4,465		$115,100
Surface Coal Mines						
<20 emp.	21	5	1	105	$25.78	$2,707
20 to 500 emp.	27	5	1	135	$25.78	$3,480
>500 emp.	0	5	1	0	$25.78	$0
Total Surface				240		$6,187
Total				4,705		$121,287

[a] Source: Table IV-13.

[b] 1 hour = 0.8333 hours (50 minutes) for certified dust technician to prepare, disassemble, and clean the sampling unit after completion of sampling + 0.1666 hours (10 minutes) for mine supervisor to make operational checks of the sampling device during the shift.

[c] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

Existing §71.209(a)&(c)
Burden Hours and Costs to Complete Dust Data Cards and Send Samples and Cards to MSHA Due to Additional Citations

A completed dust data card must accompany each abatement sample mailed to MSHA. For operators that contract out their sampling, no separate costs are shown in this PREA for completing dust data cards and sending the samples along with the dust data cards to MSHA. These costs are already included in the contractors' charges, which includes an amount for collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. The number of citations associated with separately costing out the time to complete dust data cards, and to send samples and dust data cards to MSHA is shown in column (e) of Table IV-14. MSHA estimates that a certified person (normally the mine safety inspector or mine supervisor) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust card, and a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA.

Table VII-7 shows, by size category, surface and underground coal operators' annual burden hours and costs to complete dust data cards and send the cards and samples to MSHA.

Table VII-7: Existing 70.209(a) & (c), 71.201(a) & (c) amd 90.201(a) & (c)
Annual Burden Hours and Costs to Complete Dust Data Cards and
Send Cards and Samples to MSHA for Analysis
(for Mines That Conduct Their Own Sampling)

Size Category	No. of Additional SS Citations[a]	No. of Samples and Dust Cards per Citation	Time to Complete Dust Card and Send Card and Sample to MSHA[b]	Annual Burden Hours	Cost to Complete Dust Card and Send Card and Sample to MSHA [c]	Total Annual Costs
Underground Coal Mines						
<20 emp.	123	5	0.125	76.8	$26.94	$2,069
20 to 500 emp. no lgwl	617	5	0.125	385.8	$26.94	$10,396
20 to 500 emp. lgwl	88	5	0.125	55.0	$26.94	$1,481
Sub-total	705			440.8		$11,877
>500 emp. no lgwl	30	5	0.125	18.9	$26.94	$508
>500 emp. lgwl	4	5	0.125	2.4	$26.94	$65
Sub-total	34			21.3		$573
				538.8		$14,519
Surface Coal Mines						
<20 emp.	11	5	0.125	7.0	$26.94	$187
20 to 500 emp.	19	5	0.125	12.2	$26.94	$327
>500 emp.	0	5	0.125	0.0	$26.94	$0
Total Surface				19.1		$515
Total				558.0		$15,034

[a] Citations from Table IV-15.

[b] 0.125 = (0.025 hrs. to complete dust data card) + (0.1 hrs. to prepare and send dust data card and sample).

[c] $26.94 = ((0.025 hrs. x $54.92 hourly wage) + (0.1 hrs. x $19.95 hourly wage)) / (0.025 hrs. + 0.1 hrs.)

Existing §71.210(b)
Burden Hours and Costs to Post Abatement Sample Results Due to Additional Citations

After processing the abatement samples, the Agency sends the sampling results to the affected operator. Upon receipt of the sampling results, the operator must post the one page report on the mine bulletin board for at least 31 days. MSHA estimates that a clerical worker takes approximately 0.1 hours (6 minutes) to copy and post the one page summary of the sample results. Existing §90.201(b) prohibits operators from posting the abatement sampling results related to part 90 citations. Instead, the operator provides a copy of the sampling results to the affected part 90 miner. For purposes of this cost analysis, MSHA assumes that it takes the same amount of time to provide a copy of the sampling results to the affected part 90 miner as it would to post the sampling results on the mine bulletin board. Posting sample results would apply both to operators that perform their own sampling and to those that contract out their sampling.

Table VII-8 shows, by mine size, surface and underground coal operators' annual burden hours and costs for posting sampling results.

Table VII-8: Existing 70.210(b), 71.210(b) and 90.210(b)
Annual Burden Hours and Costs to Post Abatement Sample
Results that Are Due to Additional SS Citations

Size Category	No. of Additional SS Citations	Time to Post Sample Results Per Citation	Annual Burden Hours	Clerical Wage Rate (per hr.)	Total Annual Costs
Underground Coal Mines					
<20 emp.	128	0.1	12.8	$19.58	$251
20 to 500 emp. no lgwl	643	0.1	64.3	$19.58	$1,259
20 to 500 emp. lgwl	88	0.1	8.8	$19.58	$172
Sub-total	731		73.1		$1,431
>500 emp. no lgwl	30	0.1	3.0	$19.58	$59
>500 emp. lgwl	4	0.1	0.4	$19.58	$8
Sub-total	34		3.4		$67
Total Underground			89.3		$1,748
Surface Coal Mines					
<20 emp.	21	0.1	2.1	$19.58	$41
20 to 500 emp.	27	0.1	2.7	$19.58	$53
>500 emp.	0	0.1	0.0	$19.58	$0
Total Surface			4.8		$94
Total			94.1		$1,842

PLAN VERIFICATION RULE PAPERWORK PROVISIONS FOR UNDERGROUND COAL MINE OPERATORS

Existing § 75.370 Pursuant to § 70.205
Burden Hours and Costs to Revise Ventilation Plans

As a result of the proposed PV rule, MSHA assumes that all underground coal operators would need to revise their ventilation plans before they attempt verification sampling. MSHA estimates that each mechanized mining unit (MMU) sampled would generate a revision to the ventilation plan that would take a mine supervisor: 5 hours for MMUs in mines employing fewer than 20 workers, 6 hours for MMUs in mines employing 20 to 500 workers, and 7 hours for MMUs in mines employing more than 500 workers.

First Year Proposed PV Rule in Effect

After the first round of verification sampling, some operators would fail to verify their ventilation plans and thus would need to conduct additional round(s) of verification sampling. Before each round of verification sampling MSHA assumes that operators would need to revise their ventilation plan. In the first year of the proposed PV rule, MSHA estimates that only 3 rounds of verification sampling would be needed before all underground coal operators had verified ventilation plans. Table VII-9 shows, by size category, the number of MMUs in each of the three rounds that are affected in the first year of the proposed PV rule.

Table VII-9:
MMUs Affected
First Year of Proposed PV Rule

Ug. Coal Size Category	No. of MMUs Affected in 1st Round [a]	No. of MMUs Affected in 2nd Round [a]	No. of MMUs Affected in 3rd Round [a]	Total MMUs Affected in First Year
<20 emp.	200	50.0	4.0	254.0
20 to 500 emp. no lgwl	560	140.0	15.0	715.0
20 to 500 emp. lgwl	42	27.7	22.0	91.7
>500 emp. no lgwl	23	5.8	0.4	29.2
>500 emp. lgwl	8	4.8	4.0	16.8

[a] Source: Table IV-21.

Subsequent Year Proposed PV Rule in Effect

On an annual basis, MSHA assumes that 15% of all MMUs, in each mine size category, would need to have their mine ventilation plans revised. Table VII-10 shows, by size category, the number of MMUs affected each year after the first year of the proposed PV rule.

Table VII-10:
MMUs Affected
Annually, After First Year of Proposed PV Rule

Ug. Coal Size Category	No. of MMUs Affected Annually After the First Year of the Proposed PV Rule [a]
<20 emp.	30.0
20 to 500 emp. no lgwl	84.0
20 to 500 emp. lgwl	6.3
>500 emp. no lgwl	3.5
>500 emp. lgwl	1.2

[a] Source: Table IV-22. Numbers are rounded.

Table VII-11 shows, by size category, underground coal operators' first year burden hours and costs to revise ventilation plans.

Table VIII-12 shows, by size category, underground coal operators' annual burden hours and costs to revise mine ventilation plans.

Table VII-11: Existing 75.370 Pursuant to Proposed 70.205
Adjusted First Year Burden Hours and Costs to Write Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Time to Make Plan Changes (in hrs.)	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Superv. Wage Rate (per hr.)	Adj. First Year Burden Costs	Adj. First Year Burden Costs Annualized [d]
<20 emp.	254.0	5	1,270.0	150.0	1,120.0	$54.92	$61,510	$4,306
20 to 500 emp. no lgwl	715.0	6	4,290.0	504.0	3,786.0	$54.92	$207,927	$14,555
20 to 500 emp. lgwl	91.7	6	550.3	37.8	512.5	$54.92	$28,148	$1,970
Sub-total	806.72		4,840.3	541.8	4,298.5		$236,075	$16,525
>500 emp. no lgwl	29.2	7	204.1	24.2	179.9	$54.92	$9,881	$692
>500 emp. lgwl	16.8	7	117.6	8.4	109.2	$54.92	$5,997	$420
Sub-total	46.0		321.7	32.6	289.1		$15,878	$1,111
Total	1,106.7		6,432.0		5,707.6		$313,463	$21,942

[a] Source: Table VII-9.

[b] An amount equivalent to annual burden hours from Table VII-12.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-12: Existing 75.370 Pursuant to Proposed 70.205
Annual Burden Hours and Costs to Write Revised Ventilation Plan

Ug. Coal Size category	No. of MMUs [a]	Time to Make Plan Changes (in hrs.)	Annual Burden Hours	Superv. Wage Rate (per hr.)	Annual Burden Costs
<20 emp.	30.0	5	150.0	$54.92	$8,238
20 to 500 emp. no lgwl	84.0	6	504.0	$54.92	$27,680
20 to 500 emp. lgwl	6.3	6	37.8	$54.92	$2,076
Sub-total	90.3		541.8		$29,756
>500 emp. no lgwl	3.5	7	24.2	$54.92	$1,326
>500 emp. lgwl	1.2	7	8.4	$54.92	$461
Sub-total	4.7		32.6		$1,788
Total	125.0		724.4		$39,781

[a] Source: Table VII-10.

Existing § 75.370(a)(2)&(a)(3)(i)
Burden Hours and Costs to Copy and Send Revised Ventilation Plan to MSHA

All underground coal operators revising ventilation plans would need to send copies of the plans to the appropriate MSHA District Manager and to the miners' representative. MSHA assumes a clerical worker would take 0.2 hours (12 minutes) for each MMU sampled in order to copy and prepare to send in a revised ventilation plan.

Table VII-9 shows, by size category, the number of MMUs affected by this provision in the first year of the proposed PV rule. Table VII-10 shows, by size category, the number of MMUs affected by this provision for each year after the first year.

Table VII-13 shows, by size category, underground coal operators' first year burden hours and costs to copy and send revised ventilation plans to the MSHA District Manager and the miners' representative that are related to the first, second, and third rounds of the original verification sampling.

Table VII-14 shows, by size category, underground coal operators' annual burden hours and costs to copy and send revised ventilation plans to the MSHA District Manager and the miners' representative.

Table VII-13: Existing 75.370(a)(2) & (a)(3)(i)
Adjusted First Year Burden Hours and Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Time to Copy & Send Two Plans per MMU (in hrs.) [b]	First Year Burden Hours	Annual Burden Hours [c]	Adj. First Year Burden Hours [d]	Clerical Worker wage Rate (per hr.)	Adj. First Year Burden Costs	Adj. First Year Burden Costs Annualized [e]
<20 emp.	254.0	0.4	101.6	12.0	89.6	$19.58	$1,754	$123
20 to 500 emp. no lgwl	715.0	0.4	286.0	33.6	252.4	$19.58	$4,942	$346
20 to 500 emp. lgwl	91.7	0.4	36.7	2.5	34.2	$19.58	$669	$47
Sub-total	806.7		322.7	36.1	286.6		$5,611	$393
>500 emp. no lgwl	29.2	0.4	11.7	1.4	10.3	$19.58	$201	$14
>500 emp. lgwl	16.8	0.4	6.7	0.5	6.2	$19.58	$122	$9
Sub-total	46.0		18.4	1.9	16.5		$323	$23
Total			442.7	50.0	392.7		$7,689	$538

[a] **Source: Table VII-9.**

[b] **0.4 = (0.2 x 2): where 0.2 hrs. is the time for a clerical worker to copy and send in a ventilation plan; and 2 is the number of plans to mail per MMU.**

[c] **An amount equivalent to annual burden hours from Table VII-14.**

[d] **Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.**

[e] **Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.**

Table VII-14: Existing 75.370(a)(2) & (a)(3)(i)
Annual Burden Hours and Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Time to Copy & Send Two Plans per MMU (in hrs.) [b]	Annual Year Burden Hours	Clerical Worker wage Rate (per hr.)	Annual Year Burden Costs
<20 emp.	30.0	0.4	12.0	$19.58	$235
20 to 500 emp. no lgwl	84.0	0.4	33.6	$19.58	$658
20 to 500 emp. lgwl	6.3	0.4	2.5	$19.58	$49
Sub-total	90.3		36.1		$707
>500 emp. no lgwl	3.5	0.4	1.4	$19.58	$27
>500 emp. lgwl	1.2	0.4	0.5	$19.58	$9
Sub-total	4.7		1.9		$36
Total	125.0		50.0		$979

[a] Source: Table VII-10.

Existing § 75.370(a)(3)(iii)
Burden Hours and Costs to Post Revised Ventilation Plans

All underground coal operators would need to post revised ventilation plans. MSHA assumes a clerical worker would take 0.1 hours (6 minutes) to copy and post a revised ventilation plan.

Table VII-9 shows, by size category, the number of MMUs affected by this provision in the first year of the proposed PV rule. Table VII-10 shows, by size category, the number of MMUs affected by this provision for each year after the first year.

Table VII-15 shows, by size category, underground coal operators' first year burden hours and costs to post revised ventilation plans.

Table VII-16 shows, by size category, underground coal operators' annual burden hours and costs to post revised ventilation plans.

Table VII-15: Existing 75.370(a)(3)(iii)
Adjusted First Year Burden Hours and Costs to Post Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs [a]	Time to Post Plan Per MMU	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Clerical Wage Rate (per hr.)	Adj. First Year Burden Costs	Adjusted First Year Burden Costs Annualized [d]
<20 emp.	254.0	0.1	25.4	3.0	22.4	$19.58	$439	$31
20 to 500 emp. no lgwl	715.0	0.1	71.5	8.4	63.1	$19.58	$1,235	$86
20 to 500 emp. lgwl	91.7	0.1	9.2	0.6	8.5	$19.58	$167	$12
Sub-total	806.7		80.7	9.0	71.6		$1,403	$98
>500 emp. no lgwl	29.2	0.1	2.9	0.3	2.6	$19.58	$50	$4
>500 emp. lgwl	16.8	0.1	1.7	0.1	1.6	$19.58	$31	$2
Sub-total	46.0		4.6	0.5	4.1		$81	$6
Total			110.7	12.5	98.2		$1,922	$135

[a] Source: Table VII-9.

[b] An amount equivalent to annual burden hours from Table VII-16.

[e] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-16: Existing 75.370(a)(3)(iii)
Annual Burden Hours and Costs to Post Revised Ventilation Plan

Ug. Coal Size Category	No. of MMUs[a]	Time to Post Plan Per MMU	Annual Burden Hours	Clerical Wage Rate (per hr.)	Annual Burden Costs
<20 emp.	30.0	0.1	3.0	$19.58	$59
20 to 500 emp. no lgwl	84.0	0.1	8.4	$19.58	$164
20 to 500 emp. lgwl	6.3	0.1	0.6	$19.58	$12
Sub-total	90.3		9.0		$177
>500 emp. no lgwl	3.5	0.1	0.3	$19.58	$7
>500 emp. lgwl	1.2	0.1	0.1	$19.58	$2
Sub-total	4.7		0.5		$9
Total	125.0		12.5		$245

[a] Source: Table VII-10.

Proposed §75.370(h)
Burden Hours and Costs to Make Available Records Concerning Material Produced

For each MMU sampled, operators must make the records of the amount of material produced during each shift available to an authorized representative of the Secretary and the miner representative. Since operators already keep such records as part of normal business practice, then this provision would not impose any additional costs on operators.

The number of MMUs affected by this provision are: 200 MMUs employing fewer than 20 workers, 602 MMUs (560 non-longwalls and 42 longwalls) employing 20 to 500 workers, and 31 MMUs (23 non-longwalls and 8 longwalls) employing more than 500 workers. The average number of shifts are estimated to be: 1 shift at MMUs in mines employing fewer than 20 workers, 2 shifts at MMUs in mines employing 20 to 500 workers, and 3 shifts at MMUs employing more than 500 workers. The annual number of workdays are estimated to be 250 days (5 workdays/week x 52 weeks/year) for non-longwall MMUs, and 312 (6 workdays/week x 52 weeks/year) for longwall MMUs.

Table VIII-17 shows, by size category, underground coal operators' annual burden hours and related costs to record the amount of material produced.

Table VII-17: Proposed 75.370(h)
Annual Burden Hours and Costs to Record Material Produced

Ug. Coal Size Category	No. of MMUs	Avg. No. of Shifts Per Day	Time to Record Production (in hrs.) [a]	Avg. No. of Workdays (per yr.)	Annual Burden Hours	Superv. Wage Rate (in hrs.)	Annual Burden Costs
<20 emp.	200	1	0	260	0	$54.92	$0
20 to 500 emp. no lgwl	560	2	0	260	0	$54.92	$0
20 to 500 emp. lgwl	42	2	0	312	0	$54.92	$0
Sub-total	602				0		$0
>500 emp. no lgwl	23	3	0	260	0	$54.92	$0
>500 emp. lgwl	8	3	0	312	0	$54.92	$0
Sub-total	31				0		$0
Total	833				0		$0

[a] Time to record material produced is estimated to be 0.025 hrs. (or 1.5 minutes) per shift. However, zero is shown above as the time to record because mine operators are already performing this function as part of normal business practice.

Proposed §70.201(f)
Burden Hours and Costs to Notify Miners and Their Representatives of Verification Sampling

Paragraph (f) requires that operators give affected miners and their representatives prior notice of the date and time of intended sampling. With respect to plan verification sampling, all miners and their representatives would have to be notified. This notification would be provided each time an MMU is involved in a plan verification sampling. MSHA estimates that a clerical worker would take 0.2 hours (12 minutes) to write and then post the required information.

Table VII-9 shows, by size category, the number of MMUs affected by this provision in the first year of the proposed PV rule. Table VII-10 shows, by size category, the number of MMUs affected by this provision in each year after the first year.

Table VII-18 shows, by size category, underground coal operators' first year burden hours and costs for notification prior to the first, second, and third rounds of original verification sampling.

Table VII-19 shows, by size category, underground coal operators' annual burden hours and costs for notification of verification sampling.

Table VII-18: Proposed 70.201(f)
Adjusted First Year Burden Hours and Costs for Notification of Plan Verification Sampling

Ug. Coal Size Category	No. of MMUs [a]	Time to Notify Per MMU	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Clerical Wage Rate (per hr.)	Adj. First Year Burden Costs	Adjusted First Year Burden Costs Annualized [d]
<20 emp.	254.0	0.2	50.8	6.0	44.8	$19.58	$877	$61
20 to 500 emp. no lgwl	715.0	0.2	143.0	16.8	126.2	$19.58	$2,471	$173
20 to 500 emp. lgwl	91.7	0.2	18.3	1.3	17.1	$19.58	$335	$23
Sub-total	806.7		161.3	18.1	143.3		$2,806	$196
>500 emp. no lgwl	29.2	0.2	5.8	0.7	5.1	$19.58	$101	$7
>500 emp. lgwl	16.8	0.2	3.4	0.2	3.1	$19.58	$61	$4
Sub-total	46.0		9.2	0.9	8.3		$162	$11
Total	1,106.7		221.3	25.0	196.3		$3,844	$269

[a] Source: Table VII-9.

[b] An amount equivalent to annual burden hours from Table VII-19.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-19: Proposed 70.201(f)
Annual Burden Hours and Costs for
Notification of Plan Verification Sampling

Ug. Coal Size Category	No. of MMUs [a]	Time to Notify Per MMU	Annual Year Burden Hours	Clerical Wage Rate (per hr.)	Annual Burden Costs
<20 emp.	30.0	0.2	6.0	$19.58	$117
20 to 500 emp. no lgwl	84.0	0.2	16.8	$19.58	$329
20 to 500 emp. lgwl	6.3	0.2	1.3	$19.58	$25
Sub-total	90.3		18.1		$354
>500 emp. no lgwl	3.5	0.2	0.7	$19.58	$14
>500 emp. lgwl	1.2	0.2	0.2	$19.58	$5
Sub-total	4.7		0.9		$18
Total	125.0		25.0		$489

[a] Source: Table VII-10.

Proposed §70.204
Burden Hours and Costs to Conduct Verification Sampling

MSHA estimates that it takes approximately 1 hour to prepare the sampling device and perform the required checks during sampling. This time period includes 0.8333 hours (50 minutes) of a certified dust technician's time to prepare, disassemble, and clean the sampling unit after completion of sampling. In addition, it takes a mine supervisor 0.1666 hours (10 minutes) to make the required operational checks of the sampling device during the shift. The cost per sample when operators either (1) sample with their own equipment; (2) sampling with rented equipment; or (3) contract out their sampling responsibilities, is estimated in Table IV-13. The cost of sampling can be found in Table IV-13.

Table IV-34 shows, by size category, that the number of verification samples estimated to be taken for MMUs during the first year are:

- 236 samples for MMUs in mines employing fewer than 20 workers,
- 671 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 253 samples for MMUs in longwall mines employing 20 to 500 workers,
- 27 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 45 samples for MMUs in longwall mines employing more than 500 workers.

Table IV-35 shows, by size category, that the number of verification samples estimated to be taken for MMUs for every year after the first year are:

- 134 samples for MMUs in mines employing fewer than 20 workers,
- 375 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 38 samples for MMUs in longwall mines employing 20 to 500 workers,
- 15 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 7 samples for MMUs in longwall mines employing more than 500 workers.

Note that four percent of MMUs at mines employing fewer than 20 workers and non-longwall MMUs at mines employing 20 to 500 workers contract out their sampling responsibilities. Therefore, only 96 percent of samples in these categories are used to determine burden hours and costs.

Table VII-20 shows, by size category, underground coal operators' first year burden hours and costs for conducting verification sampling.

Table VII-21 shows, by size category, underground coal operators' annual burden hours and costs for conducting verification sampling.

Table VII-20: Proposed 70.204
Adjusted First Year Burden Hours and Costs to Conduct Verification Sampling

Ug. Coal Size Category	No. of First Year Samples	Time Per Sample (in hrs.) [a]	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Cost Per Sample [d]	Adj. First Year Burden Costs	Adjusted First Year Costs Annual-ized [e]
<20 emp.	236	1	236	134	102	$25.78	$2,627	$184
20 to 500 emp. no lgwl	671	1	671	375	296	$25.78	$7,618	$533
20 to 500 emp. lgwl	253	1	253	38	216	$25.78	$5,559	$389
Sub-total	924		924	413	511		$13,177	$922
>500 emp. no lgwl	27	1	27	15	11	$25.78	$296	$21
>500 emp. lgwl	45	1	45	7	37	$25.78	$966	$68
Sub-total	72		72	23	49		$1,262	$88
Total			1,232	570	662		$17,066	$1,195

[a] 1 hr. = 0.8333 hrs. + 0.1667 hrs.

[b] An amount equivalent to annual burden hours from Table VII-21.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

[e] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-21: Propose 70.204
Annual Burden Hours and Costs to Conduct Verification Sampling

Ug. Coal Size Category	No. of Annual Samples After First Yr. [a]	Time Per Sample (in hrs.) [a]	Annual Burden Hours	Cost Per Sample [b]	Annual Burden Costs
<20 emp.	134	1	134	$25.78	$3,457
20 to 500 emp. no lgwl	375	1	375	$25.78	$9,679
20 to 500 emp. lgwl	38	1	38	$25.78	$968
Sub-total	413		413		$10,647
>500 emp. no lgwl	15	1	15	$25.78	$398
>500 emp. lgwl	7	1	7	$25.78	$184
Sub-total	23		23		$582
Total	570		570		$14,686

[a] Source: Table IV-33.

[b] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 x $54.92).

Proposed §70.216(a)
Burden Hours and Costs to Complete Dust Data Cards and Send Samples and Cards to MSHA Due to Verification Sampling

Each verification sample and its associated dust data card must be sent to MSHA by operators conducting their own sampling. A completed dust data card must accompany a verification sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare and send one sample along with the dust data card to MSHA.

Table IV-36 shows, by size category, that the number of verification samples associated with completing dust data cards and sending them along with the samples to MSHA during the first year are:

- 226 samples for MMUs in mines employing fewer than 20 workers,
- 644 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 253 samples for MMUs in longwall mines employing 20 to 500 workers,
- 27 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 45 samples for MMUs in longwall mines employing more than 500 workers.

Table IV-37 shows, by size category, that the number of verification samples associated with completing dust data cards and sending them along with the samples to MSHA for each year after the first year.

- 129 samples for MMUs in mines employing fewer than 20 workers,
- 360 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 38 samples for MMUs in longwall mines employing 20 to 500 workers,
- 15 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 7 samples for MMUs in longwall mines employing more than 500 workers.

Table VII-22 shows, by size category, underground coal operators' first year burden hours and costs to complete dust data cards and send them along with the verification samples to MSHA.

Table VII-23 shows, by size category, underground coal operators' annual burden hours and costs to complete dust data cards and send them along with the verification samples to MSHA.

Table VII-22: Proposed 70.216(a)
Adjusted First Year Burden Hours and Costs to Complete Dust Data Cards
And Send Cards and Verification Samples to MSHA for Analysis
(for Mines That Conduct Their Own Verification Sampling)

Ug. Coal Size Category	No. of First Year Samples	Time to Complete Dust Card & Send Card & Sample to MSHA [a]	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Cost Per Burden Hour [d]	Adj. First Year Burden Costs	Adj. First Year Burden Costs Annualized [e]
<20 emp.	226	0.125	28	16	12	$26.94	$328	$23
20 to 500 emp. no lgwl	644	0.125	80	45	35	$26.94	$955	$67
20 to 500 emp. lgwl	253	0.125	32	5	27	$26.94	$726	$51
Sub-total	897		112	50	62		$1,681	$118
>500 emp. no lgwl	27	0.125	3	2	1	$26.94	$39	$3
>500 emp. lgwl	45	0.125	6	1	5	$26.94	$126	$9
Sub-total	72		9	3	6		$165	$12
Total	1,195		149	69	81		$2,174	$152

[a] 0.125 = (0.025 hrs. + 0.1 hrs.).

[b] An amount equivalent to annual burden hours from Table VII-23.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] $26.94 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

[e] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-23: Proposed 70.216(a)
Annual Burden Hours and Costs to Complete Dust Data Cards
And Send Cards and Verification Samples to MSHA for Analysis
(for Mines That Conduct Their Own Verification Sampling)

Ug. Coal Size Category	No. of Annual Samples	Time to Complete Dust Card & Send Card & Sample to MSHA [a]	Annual Burden Hours	Cost Per Burden Hour [b]	Annual Costs
<20 emp.	129	0.125	16	$26.94	$434
20 to 500 emp. no lgwl	360	0.125	45	$26.94	$1,214
20 to 500 emp. lgwl	38	0.125	5	$26.94	$126
Sub-total	398		50		$1,340
>500 emp. no lgwl	15	0.125	2	$26.94	$52
>500 emp. lgwl	7	0.125	1	$26.94	$24
Sub-total	23		3		$76
Total	549		69		$1,850

[a] 0.125 = (0.025 hrs. + 0.1 hrs.).

[b] $26.97 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

Proposed §70.217(b)(1)
Burden Hours and Costs to Post Plan Verification Sample Results

After processing the plan verification samples, the Agency sends the sampling results to the affected operator. The operator is required to post the one page verification sample results. Sampling results are posted for each MMU. MSHA estimates that a clerical worker requires 0.1 hours (6 minutes) to copy and post the one page summary of the verification sample results.

Table VII-9 shows, by size category, the number of MMUs affected by this provision in the first year of the proposed PV rule. Table VII-10 shows, by size category, the number of MMUs affected by this provision for each year after the first year.

Table VII-24 shows, by size category, underground coal operators' first year burden hours and costs to copy and post plan verification sample results.

Table VII-25 shows, by size category, underground coal operators' annual burden hours and costs to copy and post plan verification sample results.

Table VII-24: Proposed 70.217(b)(1)
Adjusted First Year Burden and Costs to Post Verification Sample Results

Ug. Coal Size Category	No. of MMUs [a]	Time to Post Sample Results Per MMU	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Clerical Wage Rate (in hrs.)	Adj. First Year Burden Costs	Adjusted First Year Burden Costs Annualized [d]
<20 emp.	254.0	0.1	25.4	3.0	22.4	$19.58	$439	$31
20 to 500 emp. no lgwl	715.0	0.1	71.5	8.4	63.1	$19.58	$1,235	$86
20 to 500 emp. lgwl	91.7	0.1	9.2	0.6	8.5	$19.58	$167	$12
Sub-total	806.7		80.7	9.0	71.6		$1,403	$98
>500 emp. no lgwl	29.2	0.1	2.9	0.3	2.6	$19.58	$50	$4
>500 emp. lgwl	16.8	0.1	1.7	0.1	1.6	$19.58	$31	$2
Sub-total	46.0		4.6	0.5	4.1		$81	$6
Total	1,106.7		110.7	12.5	98.2		$1,922	$135

[a] Source: Table VII-9.

[b] An amount equivalent to annual burden hours from Table VII-25.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[f] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-25: Proposed 70.217(b)(1)
Annual Burden Hours and Costs to Post Verification Sample Results

Ug. Coal Size Category	No. of MMUs [a]	Time to Post Sample Results Per MMU	Annual Burden Hours	Clerical Wage Rate (in hrs.)	Annual Burden Costs
<20 emp.	30.0	0.1	3.0	$19.58	$59
20 to 500 emp. no lgwl	84.0	0.1	8.4	$19.58	$164
20 to 500 emp. lgwl	6.3	0.1	0.6	$19.58	$12
Sub-total	90.3		9.0		$177
>500 emp. no lgwl	3.5	0.1	0.3	$19.58	$7
>500 emp. lgwl	1.2	0.1	0.1	$19.58	$2
Sub-total	4.7		0.5		$9
Total	125.0		12.5		$245

[a] Source: Table VII-10.

Proposed §70.209(a) and §70.212(c)(1)
Burden Hours and Costs to Write for Permission to Use Supplementary Controls and Send it to the Miners' Representative

MSHA estimates that it would take a supervisor 1 hour to prepare a request for permission to use supplementary controls. A clerical worker is estimated to spend 0.35 hours typing, making copies, and sending the request to MSHA and the representative of the miners.

As estimated in Table IV-46, the number of MMUs requesting permission to use supplementary controls in the first year of the proposed PV rule is as follows:

- 4 MMUs in mines employing fewer than 20 workers,
- 15 non-longwall MMUs in mines employing 20 to 500 workers,
- 22 longwall MMUs in mines employing 20 to 500 workers,
- 0 non-longwall MMUs in mines employing more than 500 workers, and
- 4 longwall MMUs in mines employing more than 500 workers.

As estimated in Table IV-46, The number of MMUs requesting permission to use supplementary controls on an annual basis is as follows (starting in the first year the rule takes effect):

- 10 MMUs in mines employing fewer than 20 workers,
- 27 non-longwall MMUs in mines employing 20 to 500 workers,
- 1 longwall MMU in mines employing 20 to 500 workers,
- 1 non-longwall MMU in mines employing more than 500 workers, and
- 0 longwall MMUs in mines employing more than 500 workers.

Table VII-26 shows, by size category, underground coal operators' first year burden hours and costs to write a request to use supplementary controls and send it to MSHA and the representative of the miners.

Table VII-27 shows, by size category, underground coal operators' annual burden hours and costs to write a request to use supplementary controls and send it to MSHA and the representative of the miners.

Table VII-26: Proposed 70.209(a)
First Year Burden Hours and Costs for Requesting Permission to use Supplemental Controls for Plan Verification

Ug. Coal Size Category	No. of MMUs Using PAPRs or Adm. Controls	Time to Prepare Request (in hrs.) [a]	First Year Burden Hours	Cost Per Burden Hour [b]	First Year Burden Costs	First Year Burden Costs Annualized [c]
<20 emp.	4	1.35	5	$45.76	$247	$35
20 to 500 emp. no-lgwl	15	1.35	20	$45.76	$927	$132
20 to 500 emp. lgwl	22	1.35	30	$45.76	$1,359	$193
Sub-total	37		50		$2,286	$325
>500 emp. no-lgwl	0	1.35	0	$45.76	$0	$0
>500 emp. lgwl	4	1.35	5	$45.76	$247	$35
Sub-total	4		5		$247	$35
Total	45		61		$2,780	$395

[a] 1.35 hrs. = (1 hr. + 0.35 hrs.).

[b] $45.76 =((1 hr. x $54.92) + (0.35 hrs. x $19.58))/1.35.

[c] First year burden costs annualized equals first year burden costs multiplied by 0.142, where 0.142 is the annualization factor.

Table VII-27: Proposed 70.212(c)(1)
Annual Burden Hours and Costs for Requesting Permission to Use PAPRs for Special Mining Conditions

Ug. Coal Size Category	No. of MMUs Using PAPRs	Time to Prepare Request (in hrs.) [a]	Annual Burden Hours	Cost Per Burden Hour [a]	Annual Burden Costs
<20 emp.	10	1.35	14	$45.76	$618
20 to 500 emp. no-lgwl	27	1.35	36	$45.76	$1,668
20 to 500 emp. lgwl	1	1.35	1	$45.76	$62
Sub-total	28		38		$1,730
>500 emp. no-lgwl	1	1.35	1	$45.76	$62
>500 emp. lgwl	0	1.35	0	$45.76	$0
Sub-total	1		1		$62
Total	39		53		$2,409

[a] 1.35 hrs. = (1 hr. + 0.35 hrs.).

[b] $45.76 =((1 hr. x $54.92) + (0.35 hrs. x $19.58))/1.35.

Proposed §70.217(b)(3)
Burden Hours and Costs to Post Written Request for Permission to Use Supplementary Controls

MSHA estimates that it will take a clerical worker 0.1 hours to post the written requests for permission to use supplementary controls. The number of MMUs that would have to post the request is the same as noted above when deriving the burden hours and costs to write and send to MSHA a request to use supplementary controls.

Table VII-28 shows, by size category, underground coal operators' first year burden hours and costs to post written requests to use supplementary controls.

Table VII-29 shows, by size category, underground coal operators' annual burden hours and costs to post written requests to use supplementary controls.

Table VII-28: Proposed 70.217(b)(3) & 70.209(a)
First Year Burden Hours and Costs to Post Written Permission to Use Supplemental Controls for Plan Verification

Ug. Coal Size Category	No. of MMUs Using PAPRs or Adm. Controls	Time to Copy & Post Request	First Year Burden Hours	Clerical Wage Rate (in hrs.)	First Year Burden Costs	First Year Burden Costs Annualized [a]
<20 emp.	4	0.1	0.4	$19.58	$8	$1
20 to 500 emp. no-lgwl	15	0.1	1.5	$19.58	$29	$4
20 to 500 emp. lgwl	22	0.1	2.2	$19.58	$43	$6
Sub-total	37		3.7		$72	$10
>500 emp. no-lgwl	0	0.1	0.0	$19.58	$0	$0
>500 emp. lgwl	4	0.1	0.4	$19.58	$8	$1
Sub-total	4		0.4		$8	$1
Total	45		4.5		$88	$13

[a] First year costs are multiplied by an annualization factor of 0.142.

Table VII-29: Proposed 70.217(b)(3) & 70.212(c)(1)
Annual Burden Hours and Costs to Post Written Permission
to Use PAPRs for Special Mining Conditions

Ug. Coal Size Category	No. of MMUs Using PAPRs	Time to Copy & Post Request	First Year Burden Hours	Clerical Wage Rate (in hrs.)	Annual Costs
<20 emp.	10	0.1	1.0	$19.58	$20
20 to 500 emp. no-lgwl	27	0.1	2.7	$19.58	$53
20 to 500 emp. lgwl	1	0.1	0.1	$19.58	$2
Sub-total	28		2.8		$55
>500 emp. no-lgwl	1	0.1	0.1	$19.58	$2
>500 emp. lgwl	0	0.1	0.0	$19.58	$0
Sub-total	1		0.1		$2
Total	39		3.9		$76

Proposed §70.210(a)
Burden Hours and Costs to Write a PAPR Program and Send it to the District Manager

Section 70.210(a) governs the operator writing and submitting to the District Manager a PAPR program. MSHA estimates that it would take a supervisor about 4 hours to write a PAPR program. In addition, a clerical worker is estimated to take 30 minutes (0.5 hours) to type and send the program to the District Manager. On average, MSHA expects that the PAPR program would change approximately every two years. The first year costs were therefore annualized using an annualization factor of 0.553, which reflects an investment period of two years and an annual discount rate of 7 percent. The number of MMUs, by size category, that would need to write a PAPRs program are:

- 11 MMUs in mines employing fewer than 20 workers,
- 32 non-longwall MMUs in mines employing 20 to 500 workers,
- 18 longwall MMUs in mines employing 20 to 500 workers,
- 1 non-longwall MMUs in mines employing more than 500 workers, and
- 4 longwall MMUs in mines employing more than 500 workers.

Table VII-30 shows, by size category, underground coal operators' first year burden hours and costs to write a PAPR program and send it to the District Manager.

Table VII-30: Proposed 70.210(a)
First Year Burden Hours and Costs to Write a PAPR Program

Ug. Coal Size Category	No. of MMUs Using PAPRs	Time to Write PAPR Program	First Year Burden Hours	Cost Per Burden Hour [a]	First Year Burden Costs	First Year Burden Costs Annualized [b]
<20 emp.	11	4.5	50	$50.99	$2,524	$1,396
20 to 500 emp. no-lgwl	32	4.5	144	$50.99	$7,343	$4,061
20 to 500 emp. lgwl	18	4.5	81	$50.99	$4,130	$2,284
Sub-total	50		225		$11,474	$6,345
>500 emp. no-lgwl	1	4.5	5	$50.99	$229	$127
>500 emp. lgwl	4	4.5	18	$50.99	$918	$508
Sub-total	5		23		$1,147	$634
Total	66		297		$15,145	$8,375

[a] $50.99 = ((4 hrs. x $54.92) + (0.5 hrs. x $19.58)) / 4.5 hrs.

[b] First year burden costs are multiplied by an annualization factor of 0.553.

Proposed § 70.213(a)
Burden Hours and Costs to Write an Administrative Control Program and Prepare to Send it to the District Manager

Section 70.213(a) governs the operator writing and submitting to the District Manager an administrative control program. MSHA estimates that it would take a supervisor about 2 hours to write an administrative control program. In addition, MSHA estimates that a clerical worker would take 30 minutes (0.5 hours) to type and send the program to the District Manager. On average, MSHA expects that the administrative control program would change approximately every two years. The first year costs were therefore annualized using an annualization factor of 0.553, which reflects an investment period of two years and an annual discount rate of 7 percent. The number of MMUs, by size category, that would need to write an administrative control program are:

- 3 MMUs in mines employing fewer than 20 workers,
- 10 non-longwall MMUs in mines employing 20 to 500 workers,
- 5 longwall MMUs in mines employing 20 to 500 workers,
- 0 non-longwall MMUs in mines employing more than 500 workers, and
- 0 longwall MMUs in mines employing more than 500 workers.

Table VII-31 shows, by size category, underground coal operators' first year burden hours and costs to write an administrative control program and prepare to send it to the District Manager.

Table VII-31: Proposed 70.213(a)
First Year Burden Hours and Costs
to Write an Administrative Control Program

Ug. Coal Size Category	No. of MMUs Using PAPRs	Time to Write PAPR Program	First Year Burden Hours	Cost Per Burden Hour [a]	First Year Burden Costs	First Year Burden Costs Annualized [b]
<20 emp.	3	2.5	8	$47.85	$359	$198
20 to 500 emp. no-lgwl	10	2.5	25	$47.85	$1,196	$662
20 to 500 emp. lgwl	5	2.5	13	$47.85	$598	$331
Sub-total	15		38		$1,794	$992
>500 Emp. no-lgwl	0	2.5	0	$47.85	$0	$0
>500 Emp. lgwl	0	2.5	0	$47.85	$0	$0
Sub-total	0		0		$0	$0
Total	18		45		$2,153	$1,191

[a] $47.85 = ((2 hrs. x $54.92) + (0.5 hrs. x $19.58)) / 2.5 hrs.

[b] First year burden costs are multiplied by an annualization factor of 0.553.

Proposed §70.210(a)(2)
Burden Hours and Costs for Supervisor to Prepare for Training Miners on the Use of a PAPR

In order to follow the ANSI standard, workers must be trained in the use of PAPRs as part of an overall program. Before training occurs, the operator would incur costs to prepare a training program.

MSHA assumes that a mine supervisor would give the PAPR training and estimates that it would take the mine supervisor 2 hours to prepare the training program. The number of MMUs affected are the same as determined above when deriving the burden hours and costs to write a PAPR program and send it to MSHA. Although the training given by the supervisor to miners will be annual, development of the training program is a one-time cost because it can be used in future years with minimal changes. The first year costs for the supervisor to prepare for PAPR training has been annualized using an annualization factor of 7 percent.

Table VII-32 shows, by size category, first year burden hours and costs for underground coal operators to prepare for training miners in the use of PAPRs.

Table VII-32: Proposed 70.210(a)(2)
First Year Burden Hours and Costs for Supervisor to
Prepare for Training Miners in the Use of PAPRs

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of Training Sessions	Time for Superv. to Prepare (in hrs.)	First Year Burden Hours	Superv. Wage Rate (in hrs.)	First Year Burden Costs	First Year Burden Cost Annualized [b]
<20 emp.	11	1	2	22	$54.92	$1,208	$85
20 to 500 emp. no lgwl	32	2	2	64	$54.92	$3,515	$246
20 to 500 emp. lgwl	18	2	2	36	$54.92	$1,977	$138
Sub-total	50			100		$5,492	$384
>500 emp. no lgwl	1	3	2	2	$54.92	$110	$8
>500 emp. lgwl	4	3	2	8	$54.92	$439	$31
Sub-total	5			10		$549	$38
Total	66			132		$7,249	$507

[a] Source: Table IV-54.

[b] First year burden costs annualized equals first year burden costs x 0.07, where 0.07 is the annualization factor.

Proposed §70.210(a)(2)
Burden Hours and Costs to Make a Record of PAPR Training Given to Miners

After annual PAPR training has been given, the supervisor will make a record of the training. This record will serve as proof that such training was provided. MSHA estimates that, for each miner receiving PAPR training, it would take a mine supervisor 1.5 minutes (0.025 hours) to make a record of the training. Six miners (5 existing and 1 new miner) per non-longwall MMU at mines employing fewer than 20 workers would need training. For mines employing 20 to 500 workers, 11 miners (10 existing miners and 1 new miner) per non-longwall MMU would need training. For mines employing more than 500 workers, 16 miners (15 existing miners and 1 new miner) per longwall MMU would need training.

Table VII-33 shows, by size category, underground coal operators' annual costs to make a record of PAPR training given to miners.

Table VII-33: Proposed 70.210(a)(2)
Annual Burden Hours and Costs to Make a Record of PAPR Training Given to Miners

Ug. Coal Size Category	No. of MMUs Using PAPRs [a]	No. of Miners to Train Per MMU	Time to Make Record Per Miner	First Year Burden Hours	Superv. Wage Rate	Annual Costs
<20 emp.	11	6.0	0.025	2	$54.92	$91
20 to 500 emp. no lgwl	32	11.0	0.025	9	$54.92	$483
20 to 500 emp. lgwl	18	11.0	0.025	5	$54.92	$272
Sub-total	50			14		$755
>500 emp. no lgwl	1	16.0	0.025	0	$54.92	$22
>500 emp. lgwl	4	16.0	0.025	2	$54.92	$88
Sub-total	5			2		$110
Total	66			17		$956

[a] Source: Table IV-55.

Proposed §70.215(a)
Burden Hours and Costs to Conduct Quarterly Sampling

At least once every three months, some mine operators would be required to evaluate the continued adequacy of the approved ventilation plan parameters for their MMUs under the prevailing operating conditions by conducting quarterly sampling. The costs used to conduct quarterly sampling are the same as those used to conduct plan verification sampling which are derived in Table VII-20.

The estimated annual number of quarterly samples taken by operators, in each size category, in the first year are:

- 53.2 at MMUs employing fewer than 20 workers,
- 150.9 at non-longwall MMUs employing 20 to 500 workers,
- 21.6 at longwall MMUs employing 20 to 500 workers,
- 8.3 at non-longwall MMUs employing more than 500 workers, and
- 5.6 at longwall MMUs employing more than 500 workers.

The estimated annual number of quarterly samples taken by operators, in each size category, every year after the first year are

- 85.2 at MMUs employing fewer than 20 workers,
- 241.4 at non-longwall MMUs employing 20 to 500 workers,
- 34.6 at longwall MMUs employing 20 to 500 workers,
- 9.4 at non-longwall MMUs employing more than 500 workers, and
- 6.4 at longwall MMUs employing more than 500 workers.

Table VII-34 shows, by size category, underground coal operators' first year burden hours and costs to conduct quarterly sampling.

Table VII-35 shows, by size category, underground coal operators' annual burden hours and costs to conduct quarterly sampling.

Table VII-34: Proposed 70.215(a)
Adjusted First Year Burden Hours and Costs to Conduct Quarterly Sampling

Ug. Coal Size Category	No. of First Year Samples	Time Per Sample (in hrs.) [a]	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Cost Per Sample [d]	Adj. First Year Burden Costs	Adjusted First Year Costs Annual-ized [e]
<20 emp.	53.3	1	53	85	-32	$25.78	-$824	-$58
20 to 500 emp. no lgwl	150.9	1	151	241	-91	$25.78	-$2,334	-$163
20 to 500 emp. lgwl	21.6	1	22	35	-13	$25.78	-$334	-$23
Sub-total	172.5		173	276	-104		-$2,668	-$187
>500 emp. no lgwl	8.3	1	8	9	-1	$25.78	-$29	-$2
>500 emp. lgwl	5.6	1	6	6	-1	$25.78	-$20	-$1
Sub-total	13.9		14	16	-2		-$49	-$3
Total	239.7		240	377	-137		-$3,541	-$248

[a] 1 hr. = 0.8333 hrs. + 0.1667 hrs.

[b] An amount equivalent to annual burden hours from Table VII-35.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

[e] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-35: Proposed 70.215(a)
Annual Burden Hours and Costs to Conduct Quarterly Sampling

Ug. Coal Size Category	No. of First Year Samples	Time Per Sample (in hrs.) [a]	Annual Burden Hours	Cost Per Sample [a]	Annual Burden Costs
<20 emp.	85.2	1	85	$25.78	$2,196
20 to 500 emp. no lgwl	241.4	1	241	$25.78	$6,223
20 to 500 emp. lgwl	34.6	1	35	$25.78	$892
Sub-total	276.0		276		$7,115
>500 emp. no lgwl	9.4	1	9	$25.78	$242
>500 emp. lgwl	6.4	1	6	$25.78	$165
Sub-total	15.8		16		$407
Total	377.0		377		$9,718

[a] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

Proposed §70.216(a)
Burden Hours and Costs to Complete Dust Data Cards and Prepare to Send Samples and Cards to MSHA Due to Operator Quarterly Sampling

Each quarterly sample and its associated dust data card must be sent to MSHA by operators conducting their own sampling. A completed dust data card must accompany a quarterly sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare to send one sample along with the dust data card to MSHA. Table IV-68 shows, by size category, that the number of quarterly samples for which dust data cards must be completed and sent along with the samples to MSHA during the first year is as follows:

- 51.1 samples for MMUs in mines employing fewer than 20 workers,
- 144.8 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 21.6 samples for MMUs in longwall mines employing 20 to 500 workers,
- 8.3 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 5.6 samples for MMUs in longwall mines employing more than 500 workers.

Table IV-69 shows, by size category, that the number of verification samples for which dust data cards must be completed and sent along with the samples to MSHA for each year after the first year is as follows:

- 81.8 samples for MMUs in mines employing fewer than 20 workers,
- 231.7 samples for MMUs in non-longwall mines employing 20 to 500 workers,
- 34.6 samples for MMUs in longwall mines employing 20 to 500 workers,
- 9.4 samples for MMUs in non-long-wall mines employing more than 500 workers, and
- 6.4 samples for MMUs in longwall mines employing more than 500 workers.

For MMUs at mines employing fewer than 20 workers and non-longwall MMUs at mines employing 20 to 500 workers, approximately four percent of sampling is conducted by contractors. When contractors conduct the sampling, they complete the dust data cards and send the cards and samples to MSHA. Therefore, only 96 percent of sampling in the above mentioned size categories impose a paperwork burden whereby operators themselves must actually complete the dust data cards and send them along with the samples to MSHA.

Table VII-36 shows, by size category, underground coal operators' first year burden hours and costs to complete dust data cards and prepare to send them along with the samples to MSHA due to quarterly sampling.

Table VII-37 shows, by size category, underground coal operators' annual burden hours and costs to complete dust data cards and prepare to send them along with the samples to MSHA due to quarterly sampling.

Table VII-36: Proposed 70.216(a)
Adjusted First Year Burden Hours and Costs to Complete Dust Data Cards
And Prepare to Send Cards and Quarterly Samples to MSHA for Analysis
(for Mines That Conduct Their Own Quarterly Sampling)

Ug. Coal Size Category	No. of First Year Samples	Time to Complete Dust Card & Send Card & Sample to MSHA [a]	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Cost Per Burden Hour [d]	Adj. First Year Burden Costs	Adj. First Year Burden Costs Annualized [e]
<20 emp.	51.1	0.125	6	10	-4	$26.94	-$103	-$7
20 to 500 emp. no lgwl	144.8	0.125	18	29	-11	$26.94	-$293	-$20
20 to 500 emp. lgwl	21.6	0.125	3	4	-2	$26.94	-$44	-$3
Sub-total	166.5		21	33	-12		-$336	-$24
>500 emp. no lgwl	8.3	0.125	1	1	0	$26.94	-$4	$0
>500 emp. lgwl	5.6	0.125	1	1	0	$26.94	-$3	$0
Sub-total	13.9		2	2	0		-$6	$0
Total	231.5		29	45	-17		-$446	-$31

[a] 0.125 = (0.025 hrs. + 0.1 hrs.).

[b] An amount equivalent to annual burden hours from Table VII-37.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] $26.94 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

[e] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-37: Proposed 70.216(a)
Annual Burden Hours and Costs to Complete Dust Data Cards
And Prepare to Send Cards and Quarterly Samples to MSHA for Analysis
(for Mines That Conduct Their Own Quarterly Sampling)

Ug. Coal Size Category	No. of Annual Samples	Time to Complete Dust Card & Send Card & Sample to MSHA [a]	Annual Burden Hours	Cost Per Burden Hour [b]	Annual Costs
<20 emp.	81.8	0.125	10	$26.94	$275
20 to 500 emp. no lgwl	231.7	0.125	29	$26.94	$781
20 to 500 emp. lgwl	34.6	0.125	4	$26.94	$117
Sub-total	266.3		33		$897
>500 emp. no lgwl	9.4	0.125	1	$26.94	$32
>500 emp. lgwl	6.4	0.125	1	$26.94	$22
Sub-total	15.8		2		$53
Total	363.9		45		$1,226

[a] 0.125 = (0.025 hrs. + 0.1 hrs.).

[b] $26.97 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

Proposed §70.217(b)(1)
Burden Hours and Costs to Post Quarterly Sample Results

After processing the quarterly samples, the Agency sends the sampling results back to the operator. The operator is required to post the one page quarterly sampling results. Sampling results are posted for each MMU. MSHA estimates that a clerical worker would require 0.1 hours (6 minutes) to copy and post the one page summary of the quarterly sampling results. All mine operators, including those that perform their own sampling and those that contract out sampling, would incur the burden of posting sample results.

In the first year that the proposed PV rule is in effect, the number of times that quarterly sampling would be conducted, and thus posting would occur, is estimated to be, by size category:

- 50 times for MMUs at mines employing fewer than 20 workers,
- 140 times for non-longwall MMUs at mines employing 20 to 500 workers,
- 10 times for longwall MMUs at mines employing 20 to 500 workers,
- 8 times for non-longwall MMUs at mines employing more than 500 workers, and
- 3 times for longwall MMUs at mines employing more than 500 workers.

With respect to the second year that the proposed PV rule is in effect, and for every year thereafter, quarterly sampling is estimated to be conducted four times at each MMU. The number of MMUs in each size category is: 200 MMUs in mines employing fewer than 20 workers; 602 MMUs (560 non-longwall and 42 longwall) in mines employing 20 to 500 workers; and 31 MMUs (23 non-longwall and 8 longwall) in mines employing more than 500 workers. Thus, for every year after the first year, the number of times that quarterly sampling would be conducted, and thus posting would occur, is estimated to be, by size category:

- 80 times for MMUs at mines employing fewer than 20 workers,
- 224 times for non-longwall MMUs at mines employing 20 to 500 workers,
- 16 times for longwall MMUs at mines employing 20 to 500 workers,
- 9 times for non-longwall MMUs at mines employing more than 500 workers, and
- 3 times for longwall MMUs at mines employing more than 500 workers.

Table VII-38 shows, by size category, underground coal operators' first year burden hours and costs to copy and post quarterly sample results.

Table VII-39 shows, by size category, underground coal operators' annual burden hours and costs to copy and post quarterly sample results.

Table VII-38: Proposed 70.217(b)(1)
Adjusted First Year Burden and Costs to Post Quarterly Sample Results

Ug. Coal Size Category	No. of MMUs [a]	Time to Post Sample Results Per MMU	First Year Burden Hours	Annual Burden Hours [b]	Adj. First Year Burden Hours [c]	Clerical Wage Rate (in hrs.)	Adj. First Year Burden Costs	Adjusted First Year Burden Costs Annualized [d]
<20 emp.	50	0.1	5	8.0	-3.0	$19.58	-$59	-$4
20 to 500 emp. no lgwl	140	0.1	14	22.4	-8.4	$19.58	-$164	-$12
20 to 500 emp. lgwl	10	0.1	1	1.6	-0.6	$19.58	-$12	-$1
Sub-total	150		15	24.0	-9.0		-$176	-$12
>500 emp. no lgwl	8	0.1	1	0.9	-0.1	$19.58	-$2	$0
>500 emp. lgwl	3	0.1	0	0.3	0.0	$19.58	$0	$0
Sub-total	11		1	1.2	-0.1		-$2	$0
Total	211		21	33.2	-12.1		-$237	-$17

[a] Source: Table IV-70.

[b] An amount equivalent to annual burden hours from Table VII-39.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[f] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-39: Proposed 70.217(b)(1)
Annual Burden Hours and Costs to Post Quarterly Sample Results

Ug. Coal Size Category	No. of MMUs [a]	Time to Post Sample Results Per MMU	Annual Burden Hours	Clerical Wage Rate (in hrs.)	Annual Burden Costs
<20 emp.	80	0.1	8	$19.58	$157
20 to 500 emp. no lgwl	224	0.1	22	$19.58	$439
20 to 500 emp. lgwl	16	0.1	2	$19.58	$31
Sub-total	240		24		$470
>500 emp. no lgwl	9	0.1	1	$19.58	$18
>500 emp. lgwl	3	0.1	0	$19.58	$6
Sub-total	12		1		$23
Total	332		33		$650

[a] Source: Table IV-71.

Proposed §70.215(c)(2)
Burden Hours and Costs to Make a Record of Excessive Dust Condition

If any valid quarterly concentration measurement exceeds the applicable dust standard by 0.10 mg/m^3 or more, then a record must be made. The record must include the following: the date of sampling; the location within the mine where the sample was collected and the occupation sampled; the measured dust concentration of each sample collected; and the corrective action being taken to reduce the concentration of respirable coal mine dust.

The number of overexposures, for which a record would be made, in the first year of the proposed PV rule is estimated to be:

- 1 for MMUs at mines employing fewer than 20 workers,
- 3 for non-longwall MMUs at mines employing 20 to 500 workers,
- 1 for longwall MMUs at mines employing 20 to 500 workers, and
- 1 for non-longwall MMUs at mines employing more than 500 workers.

The number of overexposures, for which a record would be made, for every year after the first year of the proposed PV rule is estimated to be:

- 2 for MMUs at mines employing fewer than 20 workers,
- 5 for non-longwall MMUs at mines employing 20 to 500 workers,
- 1 for longwall MMUs at mines employing 20 to 500 workers, and
- 1 for non-longwall MMUs at mines employing more than 500 workers.

Table VII-40 shows, by size category, underground coal operators' first year burden hours and costs to make records for overexposures associated with quarterly sampling.

Table VII-41 shows, by size category, underground coal operators' annual burden hours and costs to make records for overexposures associated with quarterly sampling.

Table VII-40: Proposed 70.215(c)(2)
Adjusted First Year Burden Hours and Costs to Make Record of Excessive Dust Exposure

Ug. Coal Size Category	No. of Over-exposures in First Year [a]	Time to Make Record	First Year Burden Hours	Annual Burden Hours [b]	Adjusted First Year Hours [c]	Cost Per Burden Hour	Adjusted First Year Costs	Adjusted First Year Burden Costs Annualized [d]
<20 emp.	1	0.1	0.1	0.2	-0.1	$54.92	-$5	$0
20 to 500 emp. no lgwl	3	0.1	0.3	0.5	-0.2	$54.92	-$11	-$1
20 to 500 emp. lgwl	1	0.1	0.1	0.1	0.0	$54.92	$0	$0
Sub-total	4		0.4	0.6	-0.2		-$11	-$1
>500 emp. no lgwl	1	0.1	0.1	0.1	0.0	$54.92	$0	$0
>500 emp. lgwl	0	0.1	0.0	0.0	0.0	$54.92	$0	$0
Sub-total	1		0.1	0.1	0.0		$0	$0
Total	6		0.6	0.9	-0.3		-$16	-$1

[a] Source: Table IV-74.

[b] An amount equivalent to annual burden hours from Table VII-41.

[c] Adjusted first year burden hours equal first year burden hours minus first year of annual burden hours.

[d] Adjusted first year burden costs annualized equal adjusted first year burden costs multiplied by 0.07, where 0.07 is the annualization factor.

Table VII-41: Proposed 70.215(c)(2)
Annual Burden Hours and Costs to Make Record
of Excessive Dust Exposure

Ug. Coal Size category	No. of Annual Overexposures After the First Year [a]	Time to Make Record	Annual Burden Hours	Cost Per Burden Hour	Annual Costs
<20 emp.	2	0.1	0.2	$54.92	$11
20 to 500 emp. no lgwl	5	0.1	0.5	$54.92	$27
20 to 500 emp. lgwl	1	0.1	0.1	$54.92	$5
Sub-total	0		0.6		$33
>500 emp. no lgwl	1	0.1	0.1	$54.92	$5
>500 emp. lgwl	0	0.1	0.0	$54.92	$0
Sub-total	0		0.1		$5
Total	2		0.9		$49

[a] Source: Table IV-75.

Proposed §90.204(b)(4)
Burden Hours and Costs for Sampling New or Transferred Part 90 Miners

Under proposed §90.204(b)(2), any time a new or transferred Part 90 miner is sampled and any sample exceeds the respirable dust standard by at least 0.1 mg/m^3, the operator must collect five samples from the affected Part 90 miner. MSHA expects that operators would need to collect five Part 90 samples for, on average, 5 Part 90 miners annually. The burden hours and costs used to conduct Part 90 sampling are the same as those used to conduct plan verification sampling, which are derived in Table VII-20. The Agency assumes that all 5 Part 90 miners would use some form of administrative control as a corrective action that would not incur any costs. For example, the Part 90 miner could be repositioned within the same work area. However the operator would still need to take five samples for each of the 5 Part 90 miners. MSHA assumes that 1 of the 5 Part 90 miners would be in a mine employing fewer than 20 workers, while the remaining 4 Part 90 miners would be in mines (2 in longwall mines and 2 in non-longwall mines) employing between 20 and 500 workers. The costs per sample when operators either (1) sample with their own equipment; (2) sample with rented equipment; or (3) contract out their sampling responsibilities, is estimated in Table IV-13.

Table VII-42 shows, by size category, underground coal operators' annual burden hours and costs to sample Part 90 miners due to proposed §90.204.

Table VII-42: Proposed 90.204(b)(4)
Annual Burden Hours and Costs for Operators to Conduct Part 90 Sampling

Ug. Coal Size Category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	Hours to Conduct Each Sampling	No. of Part 90 Samples Taken Per Miner	Annual Burden Hours	Cost Per Burden Hour [b]	Annual Burden Costs
<20 emp.	1	1	5	5	$25.78	$129
20 to 500 emp. no lgwl	2	1	5	10	$25.78	$258
20 to 500 emp. lgwl	2	1	5	10	$25.78	$258
Sub-total	4			20		$516
>500 emp. no lgwl	0	1	5	0	$25.78	$0
>500 emp. lgwl	0	1	5	0	$25.78	$0
Sub-total	0			0		$0
Total	5			25		$644

[a] Source: IV-77.

[b] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

Proposed §90.205(c)
Burden Hours and Costs to Complete Dust Data Cards and Prepare to Send samples and Cards to MSHA Due to Part 90 Sampling

A completed dust data card must accompany each Part 90 sample. MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. Each Part 90 sample and its associated dust data card must be sent to MSHA by operators conducting their own sampling. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare to send one sample along with the dust data card to MSHA. As noted earlier, for MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. For purposes of deriving the costs of completing dust data cards and sending them, along with the Part 90 samples, to MSHA, it is assumed that all Part 90 miners affected by this provision are employed at mines that conduct their own sampling.

Table VII-43 shows, by size category, underground coal operators' annual burden hours and costs to complete dust cards and prepare to send them along with the Part 90 samples to MSHA.

Table VII-43: Proposed 90.205(c)
Annual Burden Hours and Costs to Complete Dust Data Cards and Prepare to Send Cards and Part 90 Samples to MSHA for Analysis

Ug. Coal Size category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	Hours to Complete Cards & Send Sample	No. of Part 90 Samples Taken Per Miner	Annual Burden Hours	Cost Per Burden Hour [b]	Annual Burden Costs
<20 emp.	1	0.125	5	1	$26.94	$17
20 to 500 emp. no lgwl	2	0.125	5	1	$26.94	$34
20 to 500 emp. lgwl	2	0.125	5	1	$26.94	$34
Sub-total	4			3		$67
>500 emp. no lgwl	0	0.125	5	0	$26.94	$0
>500 emp. lgwl	0	0.125	5	0	$26.94	$0
Sub-total	0			0		$0
Total	5			3		$84

[a] Source: Table IV-78.

[b] $26.94 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

Proposed §90.206(b)
Burden Hours and Costs to Provide a Copy of Sample Results to Part 90 Miner

Section 90.206(b) requires the operator to provide a copy of the Part 90 sample results to the Part 90 miner. MSHA estimates that a clerical worker would take 0.1 hours (6 minutes) to copy and provide the one page report to the Part 90 miner.

Table VII-44 shows, by size category, underground coal operators' annual burden hours and costs to provide sample results to Part 90 miners.

Table VII-44: Proposed 90.206(b)
Annual Burden Hours and Costs to Provide Copy of Part 90 Sample Results to Part 90 Miners

Ug. Coal Size category	Annual No. of Part 90 Miners Affected by 90.214(b)(4) [a]	Time to Provide Copy to Miner	Annual Burden Hours	Cost Per Burden Hour	Annual Costs
<20 emp.	1	0.1	0.1	$19.58	$2
20 to 500 emp. no lgwl	2	0.1	0.2	$19.58	$4
20 to 500 emp. lgwl	2	0.1	0.2	$19.58	$4
Sub-total	4		0.4		$8
>500 emp. no lgwl	0	0.1	0.0	$19.58	$0
>500 emp. lgwl	0	0.1	0.0	$19.58	$0
Sub-total	0		0.0		$0
Total	5		0.5		$10

[a] Source: Table IV-79.

Table VII-45 shows, by size category, the first year only burden hours and costs imposed by the proposed PV rule.

Table VII-46 shows, by size category, the annual burden hours and costs imposed by the proposed PV rule.

Table VII-45:
Summary of Hours and Costs in First Year Only For Underground Coal Mine Operators

Detail	Table	<20 emp.			20 to 500 emp.			>500 emp.			Total		
		Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized	Adj. First Year Burden Hours	Adj. First Year Burden Costs	Adj. First Year Costs Annualized
Write Rev. Vent. Plan	VII-11	1,120	$61,510	$4,306	4,299	$236,075	$16,525	289	$15,878	$1,111	5,708	$313,463	$21,942
Copy & Send Plan	VII-13	90	$1,754	$123	287	$5,611	$393	17	$323	$23	393	$7,689	$538
Post Plan	VII-15	22	$439	$31	72	$1,403	$98	4	$81	$6	98	$1,922	$135
Sampl. Notification	VII-18	45	$877	$61	143	$2,806	$196	8	$162	$11	196	$3,844	$269
Verif. Sampling	VII-20	102	$2,627	$184	511	$13,177	$922	49	$1,262	$88	662	$17,066	$1,195
Complete & Send Dust Card & Sample	VII-22	12	$328	$23	62	$1,681	$118	6	$165	$12	81	$2,174	$152
Post Verif. Results	VII-24	22	$439	$31	72	$1,403	$98	4	$81	$6	98	$1,922	$135
Request Permission	VII-26	5	$247	$35	50	$2,286	$325	5	$247	$35	61	$2,780	$395
Post Request	VII-28	0.4	$8	$1	4	$72	$10	0.4	$8	$1	5	$88	$13
Write PAPR Prog.	VII-30	50	$2,524	$1,396	225	$11,474	$6,345	23	$1,147	$634	297	$15,145	$8,375
Write Adm. Prog.	VII-31	8	$359	$198	38	$1,794	$992	0	$0	$0	45	$2,153	$1,191
Prepare PAPR Train.	VII-32	22	$1,208	$85	100	$5,492	$384	10	$549	$38	132	$7,249	$507
Quarterly Sampling	VII-34	-32	-$824	-$58	-104	-$2,668	-$187	-2	-$49	-$3	-137	-$3,541	-$248
Complete & Send Dust Card & Sample	VII-36	-4	-$103	-$7	-12	-$336	-$24	0	-$6	$0	-17	-$446	-$31
Post Quarterly Results	VII-38	-3	-$59	-$4	-9	-$176	-$12	0	-$2	$0	-12	-$237	-$17
Total		1,459	$71,334	$6,404	5,736	$280,093	$26,185	413	$19,846	$1,962	7,609	$371,273	$34,551

Table VII-46:
Summary of Annual Burden Hours and Costs For Underground Coal Mine Operators

Detail	Table	<20 emp.		20 to 500 emp.		>500 emp.		Total	
		Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs	Annual Burden Hours	Annual Burden Costs
Write Rev. Vent. Plan	VII-12	150	$8,238	542	$29,756	33	$1,788	724	$39,781
Copy & Send Plan	VII-14	12	$235	36	$707	2	$36	50	$979
Post Plan	VII-16	3	$59	9	$177	0.5	$9	12	$245
Record Material	VII-17	0	$0	0	$0	0	$0	0	$0
Sampl. Notification	VII-19	6	$117	18	$354	1	$18	25	$489
Verif. Sampling	VII-21	134	$3,457	413	$10,647	23	$582	570	$14,686
Complete & Send Dust Card & Sample	VII-23	16	$434	50	$1,340	3	$76	69	$1,850
Post Verif. Results	VII-25	3	$59	9	$177	0.5	$9	12	$245
Request Permission	VII-26	14	$618	38	$1,730	1	$62	53	$2,409
Post Request	VII-29	1	$20	3	$55	0.1	$2	4	$76
Rec. of PAPR Train.	VII-33	2	$91	14	$755	2	$110	17	$956
Quarterly Sampling	VII-35	85	$2,196	276	$7,115	16	$407	377	$9,718
Complete & Send Dust Card & Sample	VII-37	10	$275	33	$897	2	$53	45	$1,226
Post Quarterly Results	VII-39	8	$157	24	$470	1	$23	33	$650
Record Excessive Dust	VII-41	0	$11	1	$33	0.1	$5	1	$49
Part 90 Sampling	VII-42	5	$129	20	$516	0	$0	25	$644
Complete & Send Dust Card & Sample	VII-43	1	$17	3	$67	0	$0	3	$84
Results to P90 Miner	VII-44	0.1	$2	0.4	$8	0.0	$0	1	$10
Total		450	$16,113	1,488	$54,803	84	$3,181	2,022	$74,098

Proposed §70.215
Burden Hour and Cost Savings Due to the Elimination of Operator Bi-monthly Sampling

The decrease in the annual number of samples that operators would take is estimated in Table IV-96. The sampling costs used to estimate the reduced amount of operator sampling are the same sampling costs that were used above for verification and quarterly sampling.

Table VII-47 shows, by size category, underground coal operators' annual burden hours and cost savings due to the elimination of operator bi-monthly sampling.

Table VII-47: Proposed 70.215
Annual Burden Hours and Costs Savings for Sampling
Due to the Elimination of Operator Bi-monthly Sampling

Ug. Coal Size Category	No. of Samples [a]	Hours Per Sample [a]	Annual Burden Hours Saved	Cost Savings Per Sample [b]	Annual Burden Cost Savings
<20 emp.	7,824	1	7,824	$25.78	$201,690
20 to 500 emp. no lgwl	22,086	1	22,086	$25.78	$569,340
20 to 500 emp. lgwl	1,638	1	1,638	$25.78	$42,225
Sub-total	23,724		23,724		$611,565
>500 emp. no lgwl	933	1	933	$25.78	$24,051
>500 emp. lgwl	312	1	312	$25.78	$8,043
Sub-total	1,245		1,245		$32,094
Total	32,793		32,793		$845,349

[a] Source: Table IV-96.

[b] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

Proposed §70.215
Burden Hour and Cost Savings to Complete Fewer Dust Data Cards and Prepare to Send Fewer Cards and Samples to MSHA, Due to the Elimination of Operator Bi-monthly Sampling

Operator sampling would decrease as a result of operators eliminating bi-monthly sampling. Operators would no longer need to complete the dust data cards associated with samples no longer taken. Therefore, operators would realize cost savings from not having to spend time completing dust data cards and sending the cards along with the samples to MSHA for analysis. Since a dust data card must be completed for each sample, the number of dust data cards no longer needed to be completed equals the number of reduced samples, which was derived above.

MSHA estimates that a certified person (normally the mine safety inspector or an equivalent person) takes approximately 0.025 hours (1.5 minutes) to complete and sign the dust data card. Each sample and its associated dust data card must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare to send one sample along with the dust data card to MSHA.

The number of reduced annual samples is shown in Table VII-47. Four percent of MMUs at mines employing fewer than 20 workers and non-longwall MMUs at mines employing 20 to 500 workers contract out their sampling. For MMUs in mines that contract out their sampling, there are no separate costs for completing dust data cards and sending the samples along with the dust data cards to MSHA for analysis. This is because the contractor's charge includes collecting the sample, completing the dust data card, and sending the sample and dust card to MSHA. Therefore, for the size categories mentioned above, only 96 percent of the samples in Table VII-47 are used.

Table IV-48 shows, by size category, underground coal operators' annual burden hours and cost savings to complete fewer dust data cards and prepare to prepare to send them along with the samples to MSHA due to the elimination of operator bi-monthly sampling.

Table VII-48: Proposed 70.215
Annual Burden Hours and Cost Savings to Complete Fewer Dust Data Cards
And Prepare to Send Fewer Cards and Samples to MSHA for Analysis
Due to the Elimination of Operator Bi-monthly Sampling
(for Mines That Conduct Their Own Sampling)

Ug. Coal Size Category	No. of Annual Samples	Time to Complete Dust Card & Send Card & Sample to MSHA [a]	Annual Burden Hours Saved	Cost Savings Per Burden Hour [b]	Annual Burden Cost Savings
<20 emp.	7,511	0.125	939	$26.94	$25,297
20 to 500 emp. no lgwl	21,203	0.125	2,650	$26.94	$71,410
20 to 500 emp. lgwl	1,638	0.125	205	$26.94	$5,517
Sub-total	22,841		2,855		$76,927
>500 emp. no lgwl	933	0.125	117	$26.94	$3,142
>500 emp. lgwl	312	0.125	39	$26.94	$1,051
Sub-total	1,245		156		$4,193
Total	31,597		3,950		$106,417

[a] 0.125 = (0.025 hrs. + 0.1 hrs.).

[b] $26.97 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / 0.125 hrs.

Proposed §70.215
Burden Hour and Cost Savings for Posting Fewer Sample Results Due to the Elimination of Operator Bi-Monthly Sampling

After processing samples sent to MSHA, the Agency sends the sampling results back to the operator. The operator is required to post the one page sample results. As a result of the elimination of operator bi-monthly sampling, samples would not be posted 6 times per year. The annual number of times that sample results would not have to be posted is shown in Table IV-99.

After processing the samples, the Agency sends the sampling results back to the operator. The operator is required to post the one page sample results. MSHA estimates that a clerical worker requires 0.1 hours (6 minutes) to copy and post the one page summary of the sampling results.

Table VII-49 shows, by size category, underground coal operators' annual burden hours and cost savings for posting fewer sample results due to the elimination of operator bi-monthly sampling.

Table VII-49: Proposed 70.215
Annual Burden Hours and Cost Savings For Posting Sample Results
Due to the Elimation of Operator Bi-monthly Sampling

Ug. Coal Size Category	Reduction in the No. of Times MMUs are Sampled [a]	Hours to Post Sample Results Per MMU	Annual Burden Hours	Clerical Wage Rate (in hrs.)	Annual Burden Cost Savings
<20 emp.	1,200	0.1	120	$19.58	$2,350
20 to 500 emp. no lgwl	3,360	0.1	336	$19.58	$6,579
20 to 500 emp. lgwl	252	0.1	25	$19.58	$493
Sub-total	3,612		361		$7,072
>500 emp. no lgwl	138	0.1	14	$19.58	$270
>500 emp. lgwl	48	0.1	5	$19.58	$94
Sub-total	186		19		$364
Total	4,998		500		$9,786

[a] Source: Table IV-99.

Table VII-52 shows a summary, by size category, of the annual burden hours and cost savings for reduced operator sampling due to eliminating operator bi-monthly sampling.

Table VII-50:
Summary of Annual Burden Hours and Cost Savings For Underground Coal Mine Operators
Due to the Elimination of Bi-monthly Sampling

Elimination of Operator Bi-monthly Sampling	Table	<20 emp.		20 to 500 emp.		>500 emp.		Total	
		Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings
Sampling	VII-47	7,824	$201,690	23,724	$611,565	1,245	$32,094	32,793	$845,349
Complete & Send Dust Card & Sample	VII-48	939	$25,297	2,855	$76,927	156	$4,193	3,950	$106,417
Posting Results	VII-49	120	$2,350	361	$7,072	18.6	$364	500	$9,786
Total		8,883	$229,336	26,940	$695,564	1,419	$36,651	37,242	$961,552

Existing §§70.201(d) & 90.201(d)
Burden Hour and Cost Savings for Operator Abatement Sampling Due to the Elimination of Operator Abatement Sampling

Under current requirement (before the PV rule is implemented), operator sampling is still in effect and, in order to abate a citation, the operator must take abatement samples. Under the proposed PV rule all abatement sampling by operators would be eliminated. Therefore, the reduction in operator abatement sampling occurs not only for the citations that would be eliminated because of the proposed PV rule, but also for those citations that remain. Currently, the operator takes a set of 5 single full-shift abatement samples on different shifts, for each citation received. Table VII-51 shows, by size category, underground coal mine operators' annual burden hours and cost savings due to the elimination of operator abatement sampling.

Table VII-51: Existing 70.201(d) & 90.201(d)
Annual Burden Hours and Cost Savings For Eliminating Abatement Sampling as a Result of the Proposed PV Rule

Ug. Coal Size Category	No. of Citations[a]	No. of Samples Per Citation	Time per Sample[b]	Annual Burden Hours Saved	Cost Savings Per Sample [c]	Annual Burden Cost Savings
<20 emp.	184	5	1.00	920	$25.78	$23,716
20 to 500 emp. no lgwl	928	5	1.00	4,638	$25.78	$119,550
20 to 500 emp. lgwl	126	5	1.00	632	$25.78	$16,302
Sub-total	1,054			5,270		$135,852
>500 emp. no lgwl	40	5	1.00	198	$25.78	$5,104
>500 emp. lgwl	5	5	1.00	27	$25.78	$696
Sub-total	45			225		$5,800
Total	1,283			6,415		$165,368

[a] Source: Table IV-87.

[b] 1 hr. = 0.8333 hrs. + 0.1667 hrs.

[c] $25.78 = (0.8333 hrs. x $19.95) + (0.1667 hrs. x $54.92).

Existing §§70.209(c) & 90.209(c)
Burden Hour and Cost Savings to Complete Fewer Dust Data Cards and Prepare to Send Fewer Samples and Cards to MSHA Due to the Elimination of Operator Abatement Sampling

After each abatement sample is taken, a dust data card must be filled out. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector or mine supervisor, to complete and sign the dust data card. Each abatement sample, along with the dust data card, must be sent to MSHA. MSHA estimates that a certified dust technician takes 0.1 hours (6 minutes) to prepare to send one sample along with the dust data card to MSHA. Table VII-52 shows, by size category, underground coal mine operators' annual burden hours and cost savings for not having to complete dust data cards and prepare to send cards and samples to MSHA. This results from the elimination of operator abatement sampling.

Table VII-52: Existing 70.209(c)
Annual Burden and Cost Savings to Complete Fewer Dust Cards and Prepare to Send Fewer Cards and Abatement Samples to MSHA Due to the Elimination of Operator Abatement Sampling

Ug. Coal Size Category	No. of Citations[a]	No. of Samples Per Citation	Cost to Complete Dust Card & Send Sample & Dust Card to MSHA [b]	Annual Burden hours Saved	Cost Savings Per Burden Hour [c]	Annual Cost Savings
<20 emp.	177	5	0.125	110	$26.94	$2,975
20 to 500 emp. no lgwl	890	5	0.125	557	$26.94	$14,995
20 to 500 emp. lgwl	126	5	0.125	79	$26.94	$2,130
Sub-total	1,017			636		$17,125
>500 emp. no lgwl	40	5	0.125	25	$26.94	$667
>500 emp. lgwl	5	5	0.125	3	$26.94	$91
Sub-total	45			28		$758
Total	1,239			774		$20,857

[a] Source: Table IV-88.

[b] 0.125 = (0.025 hrs. + 0.1 hrs.).

[c] $26.94 = ((0.025 hrs. x $54.92) + (0.1 hrs. x $19.95)) / (0.025 hrs. + 0.1 hrs.).

Existing §§70.210(b) & 90.210(b)
Burden Hours and Cost Savings to Post Fewer Sample Results Due to the Elimination of Operator Abatement Sampling

After MSHA analyzes the abatement samples, the Agency sends the sample results back to the operator. Upon receiving the sample results, the operator must post them on the mine bulletin board. Since the proposed PV rule eliminates operator abatement sampling, operators would no longer need to post operator abatement sample results. MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the results. Table VII-53 shows, by size category, underground coal operators' annual burden hours and cost savings related to no longer having to post operator abatement sample results.

Table VII-53: Existing 70.210(b) & 90.210(b)
Annual Burden Hours and Cost Savings to Post Fewer Sample Results
Due to the Elimination of Operator Abatement Sampling

Ug. Coal Size Category	No. of Citations[a]	Time to Post Sample Results Per Citation [b]	Annual Burden Hours Saved	Clerical Wage Rate (in hrs.)	Annual Cost Savings
<20 emp.	184	0.1	18	$19.58	$360
20 to 500 emp. no lgwl	928	0.1	93	$19.58	$1,816
20 to 500 emp. lgwl	126	0.1	13	$19.58	$248
Sub-total	1,054		105		$2,064
>500 emp. no lgwl	40	0.1	4	$19.58	$78
>500 emp. lgwl	5	0.1	1	$19.58	$11
Sub-total	45		5		$88
Total	1,283		128		$2,512

[a] Source: Table IV-89.

Table VII-54 summaries, by size category, underground coal mine operators' burden hours and cost savings resulting from the elimination of operator abatement sampling.

Table VII-54:
Summary of Annual Burden Hours and Cost Savings For Underground Coal Mine Operators for Reduced Operator Sampling Due to the Elimination of Operator Abatement Sampling

Reduction in Operator Abatement Sampling	Table	<20 emp.		20 to 500 emp.		>500 emp.		Total	
		Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings	Annual Burden Hours Saved	Annual Burden Cost Savings
Abatement Sampling	VII-51	920	$23,716	5,270	$135,852	225	$5,800	6,415	$165,368
Complete & Send Dust Card & Sample	VII-52	110	$2,975	636	$17,125	28	$758	774	$20,857
Posting Results	VII-53	18	$360	105	$2,064	4.5	$88	128	$2,512
Total		1,049	$27,051	6,011	$155,040	258	$6,646	7,317	$188,737

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