DEPARTMENT OF LABOR
Mine Safety and Health Administration

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention

30 CFR Part 72
RIN 1219–AB18

Determination of Concentration of Respirable Coal Mine Dust

AGENCIES: Mine Safety and Health Administration (MSHA), Department of Labor, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Department of Health and Human Services (DHHS).

ACTION: Proposed rule; reopening of record; request for comments; notice of public hearings; correction; close of record.

SUMMARY: The Secretary of Labor and the Secretary of Health and Human Services (the Secretaries) are reopening the rulemaking record on a joint proposed rule that would determine 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 single shift. The Secretaries proposed to rescind a previous 1972 finding by the Secretary of the Interior and the Secretary of Health, Education and Welfare, on the accuracy of single shift sampling.

The Secretaries are reopening the rulemaking record to provide interested parties an additional opportunity to comment on any issue relevant to the July 2000 proposed rule; and to solicit comment on new data and information added to the record.

DATES: We must receive your comments on or before June 4, 2003.

The Agencies are also announcing that they will hold public hearings on this reopening notice. The hearing dates and times will be announced by a separate document in the Federal Register.

ADDRESSES: Comments must be clearly identified as such and transmitted either electronically to comments@msha.gov, by facsimile to (202) 693–9441, or by regular mail or hand delivery to MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2313, Arlington, Virginia 22209–3939. You may contact MSHA with any format questions. Comments are posted for public viewing at http://www.msha.gov/currentcomments.htm.

FOR FURTHER INFORMATION CONTACT: Marvin W. Nichols, Jr., Director, Office of Standards, Regulations and Variances, MSHA; phone: (202) 693–9440; facsimile: (202) 693–9441; E-mail: nichols-marvin@msha.gov.

This document is also available on MSHA’s webpage at http://www.msha.gov, under Statutory and Regulatory Information; Federal Register Documents; Proposed Rules. You can view comments filed on this rulemaking at http://www.msha.gov/currentcomments.htm.

SUPPLEMENTARY INFORMATION: In accordance with sections 101 and 202(f) of the Federal Mine Safety and Health Act of 1977 (Mine Act), this document is published jointly by the Secretary of the Department of Labor, and the Secretary of Health and Human Services.

This document should be read in conjunction with: (1) The July 7, 2000 notice of proposed rulemaking (65 FR 42068) addressing “Determination of Concentration of Respirable Coal Mine Dust, “Single Sample”; and (2) the notice of proposed rulemaking addressing Verification of Underground Coal Mine Operator’s Dust Control Plans, “Plan Verification,” 1219–AB14, published in today’s Federal Register, and (3) the associated Preliminary Regulatory Economic Analysis (PREA) available on MSHA’s webpage. The plan verification rule would require operators to verify that the dust controls specified in the ventilation plan protect miners from overexposure during normal operations.

In addition to this rulemaking, today’s Federal Register contains the Plan Verification notice of proposed rulemaking, (NPRM). In combination, these rules represent MSHA’s revised program to meet the Mine Act’s requirement that a miners’ exposure to respirable coal mine dust be maintained at or below the applicable standard on each shift.

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This reopening notice includes supplemental information which updates the preamble of the July 7, 2002 notice of proposed rulemaking. This information concerns the background, MSHA’s current enforcement policy, health effects, quantitative risk assessment, technological feasibility, economic feasibility, compliance costs and benefits, and the list of references and supporting documentation.

The Agencies organized the July 2000 proposed rule (65 FR 42068) to allow interested persons to first consider pertinent material on the Agencies’ 1972 notice followed by an overview of the NIOSH mission and assessment of the proposed rule, as well as those aspects of MSHA’s coal mine respirable dust program relevant to this proposed rule. Following the introductory material is a discussion of the “measurement objective,” or what the Secretaries intend to measure with a single sample measurement, and the application of the NIOSH Accuracy Criterion for determining whether a single sample measurement will “accurately represent” the full-shift atmospheric dust concentration. Next, the validity of the sampling process is addressed, including the performance of the approved sampler unit, sample collection procedures, and sample processing. The concept of measurement uncertainty is then addressed, and why sources of dust concentration variability and various other factors are not relevant to the proposed rule. In addition, the 2000 proposed rule summarized the health effects of occupational exposure to respirable coal mine dust, and presented MSHA’s quantitative risk assessment.

Finally, the 2000 proposed rule explained how the total measurement uncertainty is quantified, and how the accuracy of a single sample measurement meets the NIOSH Accuracy Criterion. Several Appendices, which contain relevant technical information, are attached and incorporated in the preamble to the 2000 proposed rule.

The Secretaries are interested in further comment on all issues relevant to the July 7, 2000 NPRM. The July 7, 2000 NPRM is available on MSHA’s webpage at http://www.msha.gov, under Statutory and Regulatory Information, Federal Register Documents, Proposed Rules; or you may contact MSHA at 202–693–9440 for a copy.
The proposed rule, “Determination of Concentration of Respirable Coal Mine Dust,” has been referred to as “Single, Full-Shift Sampling” based on the Agencies’ finding that a single, full-shift measurement would, after applying valid statistical techniques, accurately represent the atmospheric conditions to which the miner is continuously exposed. However, where appropriate, the term “single, full-shift sample,” will now be referred to as “single sample” in this document and any subsequent publications. This reopening notice does not change the actual finding as published in the July 7, 2000 Federal Register.

II. Background

In 1972, the Secretary of Interior and the Secretary of Health, Education, and Welfare issued a “joint finding” under the Federal Coal Mine Health and Safety Act of 1969. The finding concluded that a single, full-shift measurement of respirable dust would not, after applying valid statistical techniques, accurately represent the atmospheric conditions to which the miner is continuously exposed.

In 1994, the Secretary of Labor and the Secretary of Health and Human Services tentatively concluded that the 1972 joint finding was incorrect. Therefore, on February 18, 1994, the Secretaries published a proposed Joint Notice of Finding in the Federal Register (59 FR 8537). The Joint Notice proposed to rescind the 1972 finding and, instead, to find that a single, full-shift measurement will accurately represent the atmospheric conditions with regard to the respirable dust concentration during the shift on which it was taken. Concurrently, on February 18, 1994 (59 FR 8356) MSHA published a separate Federal Register document announcing how MSHA intended to use both single, full-shift samples and the average of multiple, full-shift samples for noncompliance determinations, and solicited public comment on the proposed enforcement procedure.

On February 3, 1998, MSHA and the National Institute for Occupational Safety and Health (NIOSH) published a final Joint Notice of Finding in the Federal Register, along with MSHA’s enforcement policy implementing the joint finding (63 FR 5664 and 5687 respectively).

In May 1998, the National Mining Association and the Alabama Coal Association petitioned the United States Court of Appeals for the 11th Circuit to review the 1998 Notice of Finding. On September 4, 1998, the 11th Circuit issued a final decision and order vacating the Joint Finding on the grounds that the Agencies failed to comply with all the requirements for a health standard under section 101(a)(6)(A) of the Mine Act (30 U.S.C. 811(a)(6)(A)).

In response to the Court’s ruling, on July 7, 2000, the Secretaries published in the Federal Register a Notice of Proposed Rulemaking (NPRM), Determination of Concentration of Respirable Coal Mine Dust (Single Sample) (65 FR 42068). In that document, the Secretaries proposed a new mandatory health standard in 30 CFR part 72 that stated that a single, full-shift measurement would accurately represent atmospheric conditions to which a miner is exposed during such shift. The proposed rule would rescind the 1972 Joint Notice of Finding.

During August 2000, three public hearings were conducted. Transcripts of those proceedings are available to the public (www.msha.gov, under Statutory and Regulatory Information).

III. MSHA’s Current Enforcement Policy

The Federal Mine Safety and Health Review Commission’s decision in MSHA v. Excel, 23 FMSHRC 600 (June 2001) precluded MSHA from citing an operator on the average of multiple samples collected by an inspector on a single shift. This decision affirmed an Administrative Law Judge dismissal of three citations alleging violations of the respirable dust standard based on the average of multiple inspector samples taken on a single shift. 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). Oral argument was held on October 7, 2002. In August 2001, MSHA ceased issuing citations on the average of multiple samples taken on a single shift. 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). Oral argument was held on October 7, 2002. In August 2001, MSHA ceased issuing citations on the average of multiple samples taken on a single shift. 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). Oral argument was held on October 7, 2002. In August 2001, MSHA ceased issuing citations on the average of multiple samples taken on a single shift. 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).

IV. Revisions To Update Data for the Rulemaking Record

The Agencies also solicit comments on revised information to update the rulemaking record which address the following:

(a) Health Effects

(Please see Section VII, 65 FR 42075, of the July 7, 2000 notice of proposed rulemaking for a complete discussion of Health Effects). The following provides an update on the Miners’ Choice Program.

MSHA and NIOSH implemented the Miners’ Choice Health Screening Program (Miners’ Choice) in October 1999. The Miners’ Choice program and Coal Workers’ X-Ray Surveillance Program (CWXSP) identify cases of simple and complicated pneumoconiosis, including coal workers’ pneumoconiosis and silicosis—hereafter referred to as “CWP.” All of the Miners’ Choice x-rays were processed using the same procedures and criteria used in the CWXSP in accordance with the requirements of 42 CFR part 37.

MSHA and NIOSH are conducting preliminary analyses of the first three years of the Miners’ Choice program. These data and analyses are being handled, conducted, and reported pursuant to the DOL’s and DHSS’s respective Information Quality Guidelines. Preliminary analyses of these data are expected in Spring 2003. The analyses will be made available to commenters through the MSHA and NIOSH Web sites, www.msha.gov and www.cdc.gov/niosh/homepage.html, respectively.

As of the end of fiscal year 2002, more than 19,500 active coal miners from 20 states voluntarily participated in Miners’ Choice. The overall CWP prevalence rate for radiographic categories of simple CWP categories 1, 2, 3, and PMF combined was 2.8% (546/19,517) among miners examined in Miners’ Choice during the 2000–2002 period. This is similar to the CWP prevalence rate of 2.25% for initial participants in the Miners’ Choice Program reported in the 2000 NPRM (65 FR 42100). Among Miners’ Choice participants, the CWP prevalence rate was higher among underground coal miners at 3.8% (356/9,265), than it was for surface coal miners, 1.8% (188/10,184). The CWP prevalence rate for independent contractors was 2.9% (2/68). These findings show that CWP continues to occur among coal miners working under the current program to

Specifically, the information is maintained in a confidential manner, all methodologies for data processing are transparent, and all available records were included. This information is reliable and accurate, and is presented in a clear and objective manner, as required by the Department of Labor’s Information Quality Guidelines and the Department of Health and Human Services’ Guidelines for Ensuring the Quality of Information Disseminated to the Public.
control respirable coal mine dust, including quartz.

(b) Quantitative Risk Assessment

The Quantitative Risk Assessment (QRA) in support of this rule has been updated to reflect more current data on the pattern of overexposures to respirable coal mine dust. The new data replaces some of the original information used to derive the risk estimates for the Single, Full-Shift Sample (65 FR 42068) and Plan Verification (65 FR 42122) Notice of Proposed Rulemakings. The updated analysis of risk provides the best available evidence pursuant to the requirements of section 101(a)(6)(A) of the Mine Act. Please refer to section VI. of the July 7, 2000 (63 FR 42123) Notice of proposed rulemaking for the previous discussion of the QRA.

In this quantitative risk assessment (QRA), MSHA will demonstrate that eliminating overexposures on each and every shift would, over a 45-year occupational lifetime, significantly reduce the cumulative exposure to respirable coal mine dust, thereby reducing the risk of both simple CWP and PMF among miners. This reduction in risk would be attributed to reducing concentrations on just that percentage of shifts currently exhibiting a pattern of recurrent overexposure.

MSHA has estimated health benefits of the two rules based on eliminating excessive exposures at only those MMUs and roofbolter designated areas (RB–DAs) currently exhibiting a pattern of recurrent overexposures on individual shifts. In the previous proposed rule, MSHA used operator sampling data from the year 1999 to identify and characterize such MMUs. In the current proposed rule, MSHA has updated the analysis to 2001, included MSHA DO sampling data in addition to operator data, and expanded the quantitative analysis to include the reduction in risk expected for certain miners not previously considered (i.e., miners working in RB–DAs). As a result, MSHA believes it has more accurately quantified the expected reduction in risk for the most exposed miner population currently subjected to recurrent overexposures.

By ‘exhibiting a pattern of recurrent overexposures,’ MSHA means that, for the same DO (MMU) or RB–DA, at least two valid MSHA or operator bimonthly samples exceeded the applicable standard in a given year. MMUs exhibiting such a pattern are highly likely to have experienced excessive exposures on at least six shifts during the year under consideration.2

Based on 2001 MSHA and operator data, there were 716 MMUs (out of 1,256 total) at which dust concentrations for the DO exceeded the applicable standard on at least two of the sampling shifts (MSHA, datafile: DO_2001.ZIP). MSHA considers these 716 MMUs, representing 57 percent of all MMUs and more than one-half of all underground coal miners working in production areas, to have exhibited a pattern of recurrent overexposures. Valid DO samples were collected on a total of 20,905 shifts at these 716 MMUs, and the applicable standard was exceeded on 4,026 of these shifts, or 19.3 percent. For this 19.3 percent, the mean excess above the standard, as measured for the DO only, was 1.04 mg/m³.3

These results are based on a large number of shifts (an average of nearly 30 at each of the 716 MMUs). Therefore, assuming representative operating conditions on these shifts, the results can be extrapolated to all production shifts, including those that were not sampled, at these same 716 MMUs. With 99-percent confidence, the overall percentage of production shifts on which the DO sample exceeded the standard was between 18.6 percent and 20.0 percent for 2001. At the same confidence level, again assuming representative operating conditions, the overall mean excess on noncompliant shifts at these MMUs was between 0.96 mg/m³ and 1.11 mg/m³.3 If, as some commenters on the earlier single sample proposed rule and the Dust Advisory Committee proceedings have alleged, operators tend to reduce production and/or increase dust controls on sampled shifts, then the true values could be higher than even the upper endpoints of these 99-percent confidence intervals.

MSHA estimates an MMU average of 384 production shifts per year. At MMUs exhibiting a pattern of recurrent overexposures in 2001, valid DO samples were obtained on an average of about 30 of these 384 production shifts. If dust concentrations at two or more of the sampled shifts exceed the standard, then it follows, at a 95-percent confidence level, that the standard is exceeded on at least six shifts over the full year. If a different definition of “exhibiting a recurrent pattern of overexposures” had been used in the QRA, the estimate of the reduction in risk and associated benefits would have been different. For example, if the criterion were that four or more bimonthly DO exposure measurements exceeded the applicable standard then overexposures would be expected, with 95% confidence, to occur on at least 20 shifts in a year of 384 shifts. Using more than two recorded overexposures as the criterion would arbitrarily reduce the population for which MSHA is estimating benefits and decrease the estimated number of prevented cases.

The available data suggest that, unless changes are made to bring dust concentrations down to or below the dust standard on every shift, the same general pattern of overexposures observed in 2001 will persist into the future.4 Therefore, MSHA concludes that without the proposed changes:

- More than half of all MMUs would continue to have a pattern of recurrent overexposures on individual shifts;
- At those MMUs with recurrent overexposures, average respirable dust concentrations for the DO would continue to exceed the applicable standards on about 20 percent of all production shifts;
- Among those shifts on which DO exposure exceeds the applicable standards, the mean excess for the DO would continue to be approximately 1 mg/m³.

If all overexposures on individual shifts are eliminated, the reduction in total respirable coal mine dust inhaled by a miner over a working lifetime will depend on three factors: (1) The average volume of air inhaled on each shift that would otherwise have exceeded the applicable standard, (2) the degree of reduction in respirable dust concentration in the air inhaled on such shifts, and (3) the number of such shifts per working lifetime. While the inhaled dose (mg) could not be measured directly, it is biologically and quantitatively related to the accumulated exposure (i.e., airborne concentration multiplied by duration, summed across jobs for each miner) used to predict CWP and PMF prevalences in the Attfield-Seixas models used in this QRA. If a miner inhales ten cubic meters of air on a shift (U.S. EPA, 1980), reducing the respirable coal mine dust concentration in that air by 1.04 mg/m³ will result in 10.4 mg less dust inhaled on that shift alone. Assuming the miner works 240 shifts per year, then reducing inhaled respirable dust by an average of 10.4 mg on 19.3 percent of the shifts will reduce the total respirable coal mine dust inhaled by 482 mg per year, or nearly 22,000 mg over a 45-year working lifetime:

1.04 mg less respirable coal mine dust per m³ of inhaled air
× 10 m³ inhaled air per shift
× 46.32 affected shifts (i.e., 19.3% of 240) per work year
× 45 work years per working lifetime
= 21,678 mg less respirable coal mine dust inhaled per working lifetime.

In Section V, the strengths and weaknesses of various epidemiological

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2 Appendix VI.1 compares the pattern observed in 2001 to that in earlier years.
eighty radiographs were eliminated because only one reading was available.

As explained earlier, for DO miners the predicted lifetime exposure reduction accumulates at a rate of 0.20 mg/m³ of reduced exposure per year during the 45 "working years" between miner retires and is no longer exposed to respirable coal mine dust, the additional risk attributable to an extra 9.0 mg-year/m³, accumulated earlier, continues to increase with age. Consequently, the benefit to be gained from eliminating individual shift excursions also continues to increase after a miner is no longer exposed. For example, assuming no additional exposure after age 65, the predicted reduction in average prevalence of CWP 1+ increases from 16.6 per thousand at age 65 to 21.4 per thousand at age 70. Presumably, the increasingly greater predicted reduction in risk of disease after age 65 is due to the latent effects of the reduction in earlier exposure and the progressive nature of CWP.

To quantify benefits expected from eliminating overexposures on each and every shift, MSHA applied the Attfield-Seixas models to a hypothetical population of miners who, on average, begin working at age 20 and retire at age 65, assuming different lifetimes. 8 To show the range of potential reductions in risk depending on a miner's lifetime, Table VI–1 presents the risk reductions predicted at three different attained ages: 65, 73, and 80 years. The projected benefit increases with attained age. However, MSHA's best estimate of the benefit to exposed miners is expressed by the reduction in prevalence of disease predicted at age 73. 7 Since not all underground coal miners are overexposed to dust with the same frequency or at the same level, Table VI–1 shows the risk reductions projected for three different categories of affected miners: (1) DO miners, (2) NDO miners who are faceworkers neither classified as a DO nor subject to a separate dust standard applicable to a RB–DA, and (3) DA roofbolters. The reduction in risk predicted for each of these three categories will now be discussed in turn.

(1) DO Miners

As explained earlier, for DO miners the predicted lifetime exposure reduction accumulates at a rate of 0.20 mg/m³ of reduced exposure per year during the 45 “working years” between

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8 Appendix VI.2 contains a technical description of the Attfield-Seixas models and an explanation of how MSHA applied them to obtain the results shown in Table VI–1. The method used in applying the models differs slightly from that used in the previous proposed rule, and Appendix VI.2 also explains this difference. In addition, an EXCEL workbook entitled “RiskRdxn.xlw” showing the formulas used in the calculations has been placed into the public record for these proceedings.

7 The expected lifetime for all American males, conditional on their having reached 20 years of age, is 73 years (calculated from U.S. Census, March 1997, Tables 18 and 119).
overexposures and who are exposed to dust
work at MMUs with a pattern of recurrent
addressed in Table VI
more of these other miners may be
receive the highest exposure, one or
usually by a lesser amount.
standard on the same shift, though
at least some of the other miners in the
applicable standard, measurements for
measured for the DO exceeds the
standard. For non-DO
measurements that exceeded the
standard on the same shift as a DO
measurement, the mean excess above
the standard was approximately 0.6 mg/
m3. For
Combining these results with the 19.3
percent rate of excessive exposures
observed for the DO on individual
shifts, it is reasonable to infer that, at
the MMUs under consideration, an
average of 1 other miner, in addition to
the one classified as DO, is currently
overexposed on at least 19 percent of all
production shifts. In 2001, the mean of
the highest dust concentration reported
for any NDO miner on sampled shifts
was 1.08 mg/m3. Over the course of
each working year, the reduction in
exposure expected for such miners as a
result of implementing the proposed
rules is 0.12 mg-yr/m3 (i.e., 19.3 percent
of one year, times 0.6 mg/m3).
To assess the reduction in risk
expected from eliminating all single-
shift exposures for these NDO miners,
MSHA again applied the Attfield and
Seixas models to miners who begin
working at age 20 and retire at age 65,
assuming lifetimes of 65, 73, and 80
years. This time, however, the resulting
decrease in predicted prevalence was
multiplied by the lifetime, 24.1 years, to
reflect the fact that the assumed rate of
overexposure applies, on average, to
about one-sixth of the faceworkers not
classified as the DO.

The second row of Table VI–1 contains the risk reductions for NDO
miners expected as a result of
eliminating all individual shift
overexposures. Over an occupational
lifetime, the average reduction in risk
for simple CWP and PMF combined,
and for PMF alone, increases with age.
However, the risk reduction at each age
is smaller for the affected NDOs than for
the affected DOs. This is expected
because the estimated probability that a
NDO (other than a RB–DA) will, under
current conditions, be overexposed on a
given shift is only 16.7 percent of the
corresponding probability for the DO.
For the MMUs under consideration, the predicted reduction in risk for
faceworkers other than the DO who live an expected lifetime of 73 years is: 2.3
fewer cases of “CWP 1+” per thousand
affected NDO miners; 1.5 fewer cases
of “CWP 2+” per thousand affected NDO
miners; and 0.7 fewer cases of PMF per
thousand affected NDO miners.

(3) Roofbolter DA (RB–DA) Miners

Because roofbolters are often exposed to higher quartz concentrations than
other miners, the applicable dust
standard for them is frequently different
from the standard applicable to other
miners working in the same MMU.
Therefore, many roofbolters are
classified as working in a “roofbolter
designated area” (RB–DA). For purposes
of this QRA, such roofbolters were
excluded from the analysis of NDO
miners presented above. Based on 2001
MSHA and operator data, 194 out of a
total 659 RB–DAs met MSHA’s criterion
for exhibiting a pattern of recurrent
overexposures—i.e., dust concentrations
exceeded the applicable standard on at
least two of the sampled shifts (MSHA,
samples were collected on a total of
3477 shifts at these 194 RB–DAs, and
the applicable standard was exceeded
on 837 of these shifts, or 24.1 percent
(95% confidence interval: 22.7 to 25.5).
For this 24.1 percent, the mean excess
above the standard, as measured for the
RB–DA only, was 0.72 mg/m3 (95-
percent confidence interval: 0.64 to
0.80).

At these RB–DAs (i.e., those exhibiting a pattern of recurrent
overexposures), the mean concentration
reported in 2001 was 0.94 mg/m3; so,
after 45 years, an RB–DA miner can be
expected, if there is no change in
current conditions, to have accumulated
a total exposure of more than 42 mg-yr/
m3. By retirement at age 65, such a
miner would be expected to accumulate,
on average, 7.8 mg-yr/m3 less exposure
if overexposures on all individual shifts
were eliminated. (45 years × 24.1% of
0.72 mg/m3). The third row of Table VI–
1 shows the estimated impact of the
proposed rules on the risk predicted for
RB–DA roofbolters. At age 73, reducing
an accumulated total dust exposure of
42 mg-yr/m3 by 7.8 mg-yr/m3 reduces the
predicted prevalence of “CWP 1+”
by 19.6 per thousand, of “CWP 2+”
by 12.1 per thousand, and of PMF by 6.0
per thousand.

4 “Affected DO miners” include all miners who
work at MMUs with a pattern of recurrent
overexposures and who are exposed to dust
concentrations similar to the DO over a 45-year
working lifetime.

5 With 95-percent confidence, on shifts for which the
DO measurement exceeds the standard, the
mean number of other occupational measurements
also exceeding the standard is at least 0.91.

6 With 95-percent confidence, the mean excess is
at least 0.59 mg/m3.

11 There are an estimated 6 NDO miners for each
DO miner, and an average of 1.0 of these 6 miners
is overexposed. This does not include roofbolters
working in designated areas, who are treated as a
separate group in the present analysis.
Appendix VI.1 DO Overexposure Patterns

In 1998, MSHA attempted to enforce compliance on individual shifts. Therefore, to compare the 2001 pattern of excess exposures on individual shifts to that of previous years, MSHA examined the regular bimonthly DO sample data submitted by mine operators in the 10 years from 1990 through 1997 and 1999–2000. The same three parameters were considered as discussed above for 2001: (1) The percentage of MMUs exhibiting a pattern of recurrent overexposures, as indicated by at least two of the valid measurements being above the applicable standard in a given year; (2) for those and only those MMUs exhibiting recurrent overexposures, the overall percentage of production shifts on which the DO was overexposed, as estimated by the percentage of valid measurements above the applicable standard; and (3) for the MMUs identified as exhibiting recurrent overexposures, the mean excess above the applicable standard, as calculated for just those valid measurements that exceeded the applicable standard in a given year.

Although MSHA found minor differences between individual years, there was no statistically significant upward or downward trend in any of these three parameters over the 1990–1997 time period (see Table VI–2). Beginning in 1999, however, there was a significant and persistent decrease in the average excess above the applicable standard (Parameter #3) for MMUs exhibiting recurrent overexposures. MSHA attributes this decrease to two important changes in the Agency’s inspection program, beginning near the end of 1998. These changes, which both resulted in increased inspector presence, were: (1) An increase in the frequency of MSHA dust sampling at underground coal mines; and (2) initiation of monthly spot inspections at mines that were experiencing difficulty in maintaining consistent compliance with the applicable dust standard.
Appendix VI.2 Application of the Attfield-Seixas Models

Attfield and Seixas (1995) provide separate logistic regression models for CWP1+, CWP2+, and PMF as a function of cumulative dust exposure (mg-yr/m³). These models all have the following form:

\[ \frac{p}{1-p} = e^{a_0 + a_1 \times \text{age} + a_2 \times \text{exposure} + a_3 \times \text{rank} \times \text{exposure}} \]  

(Eq. 1)

where \( p \) is the probability of disease at a specified age and cumulative exposure. The constant \( e \) is the base of the natural logarithms. The empirically estimated coefficients \( a_0 \) (the intercept), \( a_1, a_2, \) and \( a_3 \) differ for the three health effects considered and are presented in Table IV of Attfield and Seixas (op cit). The values for these coefficients are also shown in the Excel workbook (RiskRdxn.xlw) MSHA has placed into the public record as part of these proceedings. The coefficient \( a_3 \) of “rank” refers to an additional effect of cumulative exposure to coal mine dust in central Pennsylvania or southeastern West Virginia, which the authors attribute to the rank of the coal mined in those areas. Since few mines in those areas are currently operating, MSHA did not employ this additional effect in its application of the Attfield-Seixas models (i.e., MSHA assumed that the value of the indicator variable for “rank” is zero).

From equation 1, assuming exposure outside central Pennsylvania and southeastern West Virginia, it follows that the prevalence of disease, assuming continued exposure at current levels and approximate linearity of the exposure effect, is (per thousand miners):

\[ p_y = 1000 \times \frac{y}{1+y} \]

where \( y = e^{a_0 + a_1 \times \text{age} + a_2 \times \text{years of exposure} \times \text{(current mean annual exposure)}} \)

(Eq. 2)
The Single Sample rule would replace the previous proposed rule defining a single sample as the best estimate of the exposure for a specific shift. The proposed Single Sample rule would be based on overexposures that can be expected if all individual shifts by calculating (for ages 65, 73, and 80) the differences:

\[ \Delta = P_y - P_x \]  

(Eq. 4)

It is these differences that are presented in Table VI–1. The calculations for each specific entry are detailed in the EXCEL workbook, RiskRdxn.xlw, which has been placed into the public record. The method used in the current proposed rule defined the differences as follows:

\[ A = P_y - P_x \]

where \( x = e^{a_0 + a_1 \times \text{age} + a_2 \times \text{years of exposure}} \times \text{reduced mean annual exposure} \) (Eq. 3)

The previous method results in lower values than the proposed method assuming approximate linearity of the exposure-response relationship over the exposure range of interest. This differs from the method used in the previous proposed rule, where lower bounds on the risk reduction were calculated. The calculations in the previous proposed rule defined

\[ y = \frac{x}{1 + x} \]

The method used here provides an approximation of the expected risk reduction (\( \Delta \)), assuming approximate linearity of the exposure-response relationship over the exposure range of interest. This differs from the method used in the previous proposed rule, where lower bounds on the risk reduction were calculated. The calculations in the previous proposed rule defined

\[ y = \frac{x}{1 + x} \]

The previous method results in lower values than those shown in Table VI–1. For example, for “CWP 12866” among affected DL miners at age 73, applying the previous method to 2001 operator and MSHA data would have resulted in a calculated risk reduction of 16.3 per thousand instead of the 24.4 per thousand presented in Table VI–1. MSHA believes the method used in the current proposed rule more accurately represents the reduction in risk that can be expected if all individual shift overexposures are eliminated. The previous method, on the other hand, would continue to comply with the existing respirable dust concentration limit of 2.0 mg/m³. Such compliance with the applicable standard has proven feasible over the years. Furthermore, compliance determination based on an inspector, single sample result was found to be technologically feasible during the prior effective Interim Single-Sample Enforcement Policy (Single Sample), in effect from March 2, 1998 through September 4, 1998.

### (c) Technological Feasibility

The following discussion is a Summary of Chapters 3 and 4 of the Preliminary Regulatory Economic Analysis (PREA). The PREA is available in hard copy by request and also available on MSHA’s Web page under Statutory and Regulatory Information. This discussion parallels the Regulatory Impact Analysis discussion in the accompanying notice of proposed rulemaking, “Verification of Underground Coal Mine Operators’ Dust Control Plans and Compliance Sampling for Respirable Dust,” published by MSHA, RIN 1219–AB14, in today’s Federal Register.

MSHA, in consultation with NIOSH, believes that compliance with the proposed Single Sample rule would be technologically feasible for the mining industry. The Single Sample rule would predominantly affect MSHA’s

12 The method used here provides an approximation of the expected risk reduction (\( \Delta \)), assuming approximate linearity of the exposure-response relationship over the exposure range of interest. This differs from the method used in the previous proposed rule, where lower bounds on the risk reduction were calculated. The calculations in the previous proposed rule defined

\[ A = P_y - P_x \]

where \( y = \frac{x}{1 + x} \) and \( x = e^{a_0 + a_1 \times \text{age} + a_2 \times \text{years of exposure}} \times \text{reduced mean annual exposure} \) (Eq. 3)

The previous method results in lower values than those shown in Table VI–1. For example, for “CWP 12866” among affected DL miners at age 73, applying the previous method to 2001 operator and MSHA data would have resulted in a calculated risk reduction of 16.3 per thousand instead of the 24.4 per thousand presented in Table VI–1. MSHA believes the method used in the current proposed rule more accurately represents the reduction in risk that can be expected if all individual shift overexposures are eliminated. The previous method, on the other hand, would continue to comply with the existing respirable dust concentration limit of 2.0 mg/m³. Such compliance with the applicable standard has proven feasible over the years. Furthermore, compliance determination based on an inspector, single sample result was found to be technologically feasible during the prior effective Interim Single-Sample Enforcement Policy (Single Sample), in effect from March 2, 1998 through September 4, 1998.

### (d) Economic Feasibility

The following discussion is a Summary of Chapters 3 and 4 of the Preliminary Regulatory Economic Analysis (PREA). The PREA is available in hard copy by request and also available on MSHA’s Web page under Statutory and Regulatory Information. This discussion parallels the Regulatory Impact Analysis discussion in the accompanying notice of proposed rulemaking, “Verification of Underground Coal Mine Operators’ Dust Control Plans and Compliance Sampling for Respirable Dust,” published by MSHA, RIN 1219–AB14, in today’s Federal Register.

MSHA, in consultation with NIOSH, believes that the Single Sample rule would be economically feasible for the coal mining industry based on its most recent cost estimates. The coal mining industry would incur costs of approximately $3.1 million yearly to comply with the proposed Single Sample rule. Coal mine operators would also incur approximately an additional $1.7 million yearly in penalty costs associated with the additional citations arising from the proposed Single Sample rule. That the total $4.8 million borne yearly by the coal mining industry as a result of the proposed Single Sample 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.

Since single sample and plan verification are complementary NPRMs intended to be promulgated at the same time, the detailed presentation of assumptions and estimates for each are available in the same Preliminary Regulatory Economic Analysis (PREA) (MSHA, February 2003).

(e) Costs and Benefits: Executive Order 12866

In accordance with Executive Order 12866, the Agencies have revised the PREA of the estimated costs and benefits associated with the proposed rule for the underground and surface coal mining sectors. The key findings are summarized below.

#### 1. Compliance Costs

The Agencies estimate that the cost of this NPRM would be approximately $3.1 million annually, of which all but about $57,000 would be borne by underground coal mine operators (the residual $57,000 to be borne by surface coal mine operators). Table XIII–1 (Summary of Compliance Costs) summarizes the estimated compliance costs by provision, for underground and surface coal mines, for the following three mine size categories: (1) Those employing fewer than 20 workers; (2) those employing between 20 and 500 workers; and (3) those employing more than 500 workers.

The compliance costs arising from the Single Sample NPRM would occur as a result of an increase in the number of MSHA inspector citations issued to underground and surface coal mine operators due to the determination of noncompliance being based on the results of a MSHA single sample rather than the average of multiple-shift sample results. The additional citations
would require mine operators to undertake the following actions and to incur associated compliance costs: take corrective action(s) in order to get back into compliance with the applicable dust standard; perform abatement sampling; complete dust data cards; send abatement samples to MSHA; post abatement sample results; write respirable dust plans; and post a copy of dust plans.

In addition to these estimated compliance costs, mine operators would incur yearly penalty cost increases of about $1.7 million. Penalty costs conventionally 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. Therefore, the penalty costs are not included as part of the compliance costs of the proposed Single Sample rule. These penalty costs are relevant, however, in determining the economic feasibility of the proposed Single Sample rule.

The derivation of the above cost figures are presented in Chapter IV of the PREA that accompanies this rule.

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<tr>
<th>Costs by Category</th>
<th>Total</th>
<th>$2,717,648</th>
<th>$9,666</th>
<th>$930</th>
<th>$1,001</th>
<th>$279,395</th>
<th>$17,105</th>
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<tr>
<td>Table XIII-1</td>
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<tr>
<td>Summary of Compliance Costs for Single Sample Proposed Rule</td>
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<tr>
<td>UNDERGROUND COAL MINES</td>
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<td>$659</td>
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<td>$125</td>
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<td>&gt;20 emp.</td>
<td>$2,477,736</td>
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<td>$6,730</td>
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<td></td>
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<td>&gt;500 emp.</td>
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<td>$3,027,627</td>
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<tr>
<td>SURFACE COAL MINES</td>
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<td>Corrective Actions</td>
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<td>Mail Plan Revisions</td>
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<td>Post or Provide Dust Plan</td>
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<td>$0</td>
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<td>Post Sample Results</td>
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<td>$57</td>
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<td>$101</td>
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<td>UNDERGROUND AND SURFACE COAL MINES</td>
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<tr>
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</table>
2. Benefits

This benefits analysis is in support of the proposed Single Sample and Plan Verification rules, and updates information used in the Single Sample NPRM (65 FR 42068) and Plan Verification (65 FR 42122) NPRM. The revised Plan Verification NPRM is published elsewhere in today's Federal Register. This benefit analysis has been updated to include the revised QRA;\(^\text{14}\) the reduction in the number of active mines (and miners); and more recent information on the Black Lung Compensation Program.

For all categories of simple coal workers’ (CWP) pneumoconiosis and progressive massive fibrosis (PMF) combined, MSHA estimates, over an occupational lifetime (45-years) for miners who live to age 73 and who worked at MMUs exhibiting a pattern of recurrent overexposures, a minimum of 42 fewer cases among affected DO, NDO, and RB–DA miners than would otherwise occur without the promulgation of the Single Sample and Plan Verification rules. MSHA and NIOSH believe that the 42 prevented cases of CWP identified understate the true benefit of these proposed rules. The

\(^{14}\) The revised QRA is published in full in section VIII of the Plan Verification NPRM. The QRA has been expanded to include quantitative estimates of reduction in CWP risk estimates for affected roofbolters working in designated areas (RB–DA).
Benefits chapter of the PREA and the Benefits section of the proposed Plan Verification rule delineate the reasons why this quantitative estimate understates the health benefit to all coal miners (http://www.msha.gov/flex.htm).

(f) Paperwork Reduction Act of 1995

The proposed Single Sample rule contains information collections which are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (PRA 95). The proposed Single Sample rule would increase paperwork for surface and underground coal mine operators. Surface coal mines would incur an additional 323 burden hours annually costing $9,278. Underground coal mines would incur an additional 5,354 burden hours annually costing $142,690. All of the additional burden hours and costs for underground coal mines arising from the Single Sample rule would be eliminated as a result of the promulgation of the plan verification rule.

We invite public comments and are particularly interested in comments which:
(a) Evaluate whether the proposed collection of information (presented here and in the PREA for the proposed Single Sample rule) is necessary for the proper performance of the functions of MSHA, including whether the information would have practical utility;
(b) Evaluate the accuracy of our estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
(c) Enhance the quality, utility, and clarity of the information to be collected; and
(d) Minimize the burden of the collection of information on respondents, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submissions of responses.

We have submitted a copy of this proposed rule to OMB for its review and approval of these information collections. Interested persons are requested to send comments regarding this information collection, including suggestions for reducing this burden, if under 10 pages, by facsimile (202) 395–6974 to Attn: Desk Officer for MSHA; or by e-mail to: cathomas@omb.gov. All comments may be sent by mail addressed to the Office of Information and Regulatory Affairs, OMB New Executive Office Building, 725 17th St., NW, Rm. 10235, Washington, DC 20503, Attn: Desk Officer for MSHA. Please send a copy of your comments to MSHA at the address listed in the ADDRESSES section of the preamble. Submit written comments on the information collection not later than June 4, 2003.

Our paperwork submission summarized above is explained in detail in the PREA. The PREA includes the estimated costs and assumptions for each proposed paperwork requirement related to the proposed Single Sample rule. These paperwork requirements have been submitted to the Office of Management and Budget for review under section 3504(b) of the Paperwork Reduction Act of 1995. Respondents are not required to respond to any collection of information unless it displays a current valid OMB control number. The PREA is located on our Web site at http://www.msha.gov/REGSINFO.HTM. Comments may be sent to the addresses listed in the ADDRESSES section of the preamble.

(g) Correction to the July 7, 2000 Preamble (65 FR 42068) On page 42076, column two, line 25, change “4.8%” to “3.6%”. The sentence should read, “Across the eight surface cohorts surveyed, the prevalence rate of simple CWP and PMF combined, among participants was 5.6%.”

V. Public Hearings

MSHA and NIOSH plan to hold public hearings on the reopening notice. The hearings will be held under Section 101 of the Federal Mine Safety and Health Act of 1977. The hearings will be held in the following cities:
(a) Evansville, Indiana;
(b) Charleston, West Virginia;
(c) Grand Junction, Colorado;
(d) Birmingham, Alabama;
(e) Lexington, Kentucky; and

The specific dates, times and facilities for the hearings will be announced by a separate notice in the Federal Register.


Elaine L. Chao,
Secretary, Department of Labor.


Tommy G. Thompson,
Secretary, Department of Health and Human Services.

Appendix E—References

The following is a list of references cited in this document. Some of these are additions to the existing rulemaking record.


Mine Safety and Health Administration, Excel File, RiskRdnxnl.xlw, 2002.

Mine Safety and Health Administration, Number of Percentage of RB-DAs by Mine Size of Underground Coal Mines, and Number of Production Shifts, September 4, 2002.


Mine Safety and Health Administration, Preliminary Regulatory Economic Analysis, (PREA), Chapter 4, February 2003.


Appendix F—Supplemental References

The following references have been added to the Single Sample rulemaking record.


Mine Safety and Health Administration, Chart, Number and Percentage of MMUs by Mine Size of Underground Coal Mines, Number of Production Shifts, July 10, 2002.

Mine Safety and Health Administration, Chart, Mines and Entity in Producing Status, May 14, 2002.

National Institute for Occupational Safety and Health, Letter from Dr. Michael Attfield, to Melinda Pon, Chief, Division of Health, Mine Safety and Health Administration, dated September 30, 2002, correcting a July 11, 2002; letter from Dr. Wagner to Ms. Pon, Re: CWXSP.


