DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Part 57

RIN 1219–AB29

Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Mines

AGENCY: Mine Safety and Health Administration (MSHA), Labor.

ACTION: Proposed rule; notice of public hearings; close of comment period; request for data.

SUMMARY: We propose to revise the January 20, 2006 effective date of the existing diesel particulate matter (DPM) final concentration limit of 160 micrograms of total carbon (TC) per cubic meter of air ($160_{TC}\mu g/m^3$) in the 2001 final rule ''Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Miners,'' published in the **Federal Register** on January 19, 2001 (66 FR 5706). We are considering staggered effective dates for implementation of the final DPM limit, phased-in over a multi-year period, primarily based on feasibility issues that have surfaced since promulgation of the 2001 final rule. We also propose to delete the existing provision that restricts newer mines from applying for an extension of time for meeting the final concentration limit. In addition we are seeking specific comments and data on an appropriate conversion factor for the final DPM limit, technological implementation issues, and the costs and benefits of this rule. Finally, in this proposed rule, we are interested in comments on the appropriateness of including in a final rule a provision for medical evaluation of miners required to wear respiratory protection and transfer of miners who have been determined by a medical professional to be unable to wear a respirator. Specific questions regarding these issues are discussed within the appropriate sections in the preamble. These questions are italicized for ease of the reader.

DATES: Public hearing dates and locations are discussed in the **SUPPLEMENTARY INFORMATION** section below. If you wish to make an oral presentation for the record, we ask that you submit your request at least 5 days prior to the hearing dates. Comments and other appropriate data for the record must be received by close of business on October 14, 2005.

ADDRESSES: (1) To submit comments, please include RIN: 1219–AB29 in the subject line of the message and send them to us at either of the following addresses.

Federal e-Rulemaking portal: Go to *http://www.regulations.gov* and follow the online instructions for submitting comments.

E-mail: *zzMSHA-comments@dol.gov*. If you are unable to submit comments electronically, please identify them by RIN: 1219–AB29 and send them to us by any of the following methods.

Fax: (202) 693–9441.

Mail, hand delivery, or courier: MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Rm. 2350, Arlington, VA 22209–3939.

(2) We will post all comments on the Internet without change, including any personal information they may contain. You may access the rulemaking docket via the Internet at *http://www.msha.gov/regsinfo.htm* or in person at MSHA's public reading room at 1100 Wilson Blvd., Rm. 2349, Arlington, VA.

(3) To receive an e-mail notification when we publish rulemaking documents in the **Federal Register**, subscribe to our list serve at *http://www.msha.gov/subscriptions/subscribe.aspx.*

FOR FURTHER INFORMATION CONTACT: For information contact Rebecca J. Smith, Acting Director of the Office of Standards, Regulations, and Variances, MSHA, 1100 Wilson Blvd., Arlington, Virginia 22209–3939. Ms. Smith can be reached at (202) 693–9440.

SUPPLEMENTARY INFORMATION:

Outline of Preamble

This outline will assist the mining community in finding information in this preamble.

I. Public Hearings

We will hold three public hearings on the proposed rule. The public hearings will be begin at 9 a.m., and will be held on the following dates and locations:

Date	Location	Phone
September 26, 2005	Little America Hotel, 500 South Main Street, Salt Lake City, UT 84101	(801) 363–6781
September 28, 2005	Clarion Hotel Sports Complex, 9103 E. 39th Street, Kansas City, MO 64133	(816) 737–0200
September 30, 2005	Marriott Louisville Downtown, 280 West Jefferson Street, Louisville, KY 40202	(800) 228–9290

If you wish to make an oral presentation for the record, we ask that you submit your request at least 5 days prior to the hearing dates. However, you do not have to make a written request to speak. Any unallotted time will be made available for persons making same-day requests.

The hearings will begin with an opening statement from MSHA, followed by an opportunity for members of the public to make oral presentations to a panel. Speakers will speak in the order that they sign in. At the discretion of the presiding official, the time allocated to speakers for their presentation may be limited. Speakers and other attendees may also present information to the MSHA panel for inclusion in the rulemaking record.

The hearings will be conducted in an informal manner. The hearing panel may ask questions of speakers. Although formal rules of evidence and cross examination will not apply, the presiding official may exercise discretion to ensure the orderly progress of the hearing and may exclude irrelevant or unduly repetitious material and questions.

A verbatim transcript of the proceedings will be included in the rulemaking record. Copies of this transcript will be available to the public, and can be viewed at *http://www.msha.gov*.

We will accept post-hearing written comments and other appropriate data for the record from any interested party, including those not presenting oral statements, through close of business on October 14, 2005.

II. Rulemaking Background

On January 19, 2001 we published a final rule addressing the health hazards to underground metal and nonmetal miners from exposure to diesel particulate matter (DPM) (66 FR 5706). The rule established new health standards for these miners by requiring, among other things, use of engineering and work practice controls to reduce DPM to prescribed limits. It set an interim and final DPM concentration limit in the underground metal and nonmetal mining environment with staggered effective dates for implementation of the concentration limits. The interim concentration limit of 400_{TC} µg/m^3 was to become effective on July 20, 2002. The final concentration limit of 160_{TC} µg/m^3 is scheduled to become effective January 20, 2006. In the 2001 final rule, we projected that the mining industry would meet the final concentration limit in their mines through the use of diesel particulate filtration devices, ventilation changes, and the turnover of equipment and engines to less polluting models (66 FR 5713, 5888).

Several mining trade associations and individual mine operators challenged the final rule and the United Steelworkers of America (USWA) intervened in the case, which is now pending in the United States Court of Appeals for the District of Columbia Circuit. The parties agreed to resolve their differences through settlement negotiations with us and we delayed the effective date of certain provisions of the standard.

A. First Partial Settlement Agreement

On July 5, 2001, as a result of an agreement reached in settlement negotiations, we published two notices in the **Federal Register**. One notice (66 FR 35518) delayed the effective date of § 57.5066(b) related to tagging requirements in the maintenance standard. The second notice (66 FR 35521) proposed a rule to make limited revisions to § 57.5066(b) and added a new paragraph to § 57.5067(b) ''Engines'' regarding the definition of the term ''introduced.'' We published the final rule on February 27, 2002 (67 FR 9180).

B. Second Partial Settlement Agreement

Settlement negotiations continued on the remaining unresolved issues in the litigation, and on July 15, 2002, the parties finalized a written agreement (67 FR 47296, 47297). Under the agreement, the interim concentration limit of 400_{TC} µg/m^3 became effective on July 20, 2002, without further legal challenge. We afforded mine operators one year to develop and implement good-faith compliance strategies to meet the interim concentration limit, and we agreed to provide compliance assistance during this one-year period. We also agreed to propose rulemaking on several other disputed provisions of the 2001 final rule. The legal challenge to the rule was stayed pending completion of the additional rulemakings.

On July 20, 2003, we began full enforcement of the interim concentration limit of 400_{TC} µg/m^3. Our enforcement policy was also based on the terms of the second partial settlement agreement and includes the use of elemental carbon (EC) as an analyte to ensure that a citation based on the 400 TC concentration limit is valid and not the result of interferences (67 FR 47298). The policy was discussed with the DPM litigants and stakeholders on July 17, 2003.

III. Rulemaking History

A. Advance Notice of Proposed Rulemaking (ANPRM) on the Interim and Final Concentration Limits

On September 25, 2002, we published an Advance Notice of Proposed Rulemaking (ANPRM) (67 FR 60199). We noted in the ANPRM that the scope of the rulemaking was limited to the terms of the Second Partial Settlement Agreement and posed a series of questions to the mining community related to the 2001 final rule. We also stated our intent to propose a rule to revise the surrogate for the interim and final concentration limits and to propose a DPM control scheme similar to that included in our longstanding hierarchy of controls scheme used in our air quality standards (30 CFR 56/57.5001–.5006) for metal and nonmetal mines. In addition, we stated that we would consider technological and economic feasibility for the underground metal and nonmetal mining industry to comply with revised interim and final DPM limits. We determined at that time that some mine operators had begun to implement control technology on their underground diesel-powered equipment. Therefore, we requested relevant information on current experiences with availability of control technology, installation of control technology, effectiveness of control technology to reduce DPM levels, and cost implications of compliance with the 2001 final rule.

B. Notice of Proposed Rulemaking (NPRM) on the Interim Limit

In response to our publication of the ANPRM, some commenters recommended that we propose separate rulemakings for revising the interim and final concentration limits to give us an opportunity to gather further information to establish a final DPM limit, particularly regarding feasibility. In the subsequent notice of proposed rulemaking (NPRM) published on August 14, 2003 (68 FR 48668), we concurred with these commenters and notified the public in the NPRM that we would propose a separate rulemaking to amend the existing final concentration limit of 160_{TC} µg/m^3. We also requested comments on an appropriate final DPM limit and solicited additional information on feasibility. The proposed rule also addressed the interim concentration limit by proposing a comparable PEL of 308 µg/m^3 based on the EC surrogate and included a number of other provisions.

C. Final Rule Revising the Interim Concentration Limit

We published the final rule revising the interim concentration limit on June 6, 2005 (70 FR 32868). This rule changed the interim concentration limit of 400 µg/m^3 measured by TC to a comparable PEL of 308 µg/m^3 measured by EC. The rule requires our longstanding hierarchy of controls that is used for our other exposure-based health standards at metal and nonmetal mines, but retains the prohibition on rotation of miners for compliance. Furthermore, the rule, among other things, requires us to consider economic as well as technological feasibility in determining if operators qualify for an extension of time in which to meet the final DPM limit, and deletes the requirement for a control plan.

Currently, the following provisions of the DPM standard are effective: § 57.5060(a), establishing the interim PEL of 308 micrograms of EC per cubic meter of air which is comparable in effect to 400 micrograms of TC per cubic meter of air; § 57.5060(d), Addressing control requirements; § 57.5060(e), Prohibiting rotation of miners for compliance with the DPM standard; § 57.5061, Compliance determinations; § 57.5065, Fueling practices; § 57.5066,

Maintenance standards; § 57.5067, Engines; § 57.5070, Miner training; § 57.5071, Exposure monitoring; and, § 57.5075, Diesel particulate records.

IV. Technological Feasibility

A. Introduction

When we promulgated the 2001 final rule, we determined that control technologies would be available by January 20, 2006 to reduce DPM concentrations to 160_{TC} $\mu g/m^3$ micrograms in all types of underground metal and nonmetal mines. In the 2001 final rule, we established a new compliance scheme for these mine operators to implement that was distinguishable from that of our other exposure-based health standards by requiring that miners' exposures be reduced to a full-shift equivalent environmental or concentration limit where miners work or travel. Historically, our metal and nonmetal exposure-based health standards have been based on a miner's full-shift personal exposure and required that mine operators reduce miners' exposures to hazardous chemical substances by establishing a hierarchy of controls utilizing feasible engineering and administrative controls supplemented by respiratory protection, if necessary. Since, we were regulating DPM for the first time we needed a tool to help us to determine whether the mining industry was capable of meeting the interim and final concentration limits of the 2001 final rule using a combination of engineering and work practice controls. We also needed a compliance assistance tool to help mine operators with selection of feasible controls from technology unfamiliar to the mining industry. Consequently, we developed the Estimator.

The Estimator mathematically calculates the effect of any combination of engineering and ventilation controls on existing DPM concentrations in a given production area of a mine. This model is in the form of a spreadsheet template that permits instant display of outcomes as inputs are altered. Depending on the amount and type of equipment an operator uses, mining companies could use the Estimator to evaluate the effectiveness of these controls prior to purchasing and installing such controls. We encouraged mine operators to use this tool to assist them in making their decisions regarding the appropriate controls for their mines in meeting the 2001 concentration limits.

In the preamble to the 2001 final rule, we included data from our studies where we evaluated emissions generated by diesel powered equipment in several diverse underground mining operations which included an underground limestone mine, an underground salt mine, and an underground gold mine. In each mine, we concluded that the necessary combination of controls was available to reduce DPM concentrations well below the final concentration limit. Based on these studies, we concluded that engineering and work practice controls were available to reduce DPM concentrations in all underground metal and nonmetal mines to the required limits. We also distributed to the mining community our publication of ''Practical Ways to Control Exposure to Diesel Exhaust in Mining—a Toolbox'' which addresses various categories of available DPM controls. These categories of controls include use of low emission engines, low sulfur fuel, aftertreatment devices, ventilation, enclosed cabs, engine maintenance, work practices and training, fleet management, and respiratory protective equipment (66 FR 5712–13). Furthermore, we also examined information regarding types of engines and equipment found in underground metal and nonmetal mines along with their various ventilation systems and concluded that the 2001 final rule was technologically feasible for the mining industry (66 FR 5889).

We also concluded that the 2001 final rule was economically feasible but recognized the broad impact of the rule on the underground metal and nonmetal sector of the mining industry. We estimated that the annual cost of the 2001 final rule for these mines would be $25.1 million. The cost for an average underground metal and nonmetal mine was projected to be approximately $128,000 annually primarily for investment in equipment to meet the interim and final concentration limits. In reaching our cost estimates, we anticipated that the interim concentration limit would be met primarily with the use of diesel particulate filters (DPFs), environmental cabs, and ventilation; and the final concentration limit would be met with expanded use of DPFs, ventilation, and turnover in equipment to less polluting models (66 FR 5713, 5888).

We included a provision in the 2001 final rule to allow an additional two years for mines experiencing difficulty in reducing DPM levels to the final concentration limit due to technological constraints (66 FR 5861). The June 6, 2005, final rule on the interim limit subsequently revised the extension requirement to provide one year, renewable, extensions to comply with the final limit, based on economic or technological infeasibility, but continues to prohibit newer mines from applying for extensions (70 FR 32966).

Following promulgation of the 2001 final rule, we agreed to engage in a joint MSHA/industry 31-Mine Study to, among other things, assess the technological and economic feasibility of underground metal and nonmetal mine operators to achieve compliance with the interim and final DPM concentration limits. Feasibility at each of the 31 mines was determined using the Estimator. The analyses were based on the highest DPM sample result obtained at each mine and all major DPM emission sources at each mine plus spare equipment. On January 6, 2003, we issued our final report entitled, ''MSHA'S Report on Data Collected during a Joint MSHA/Industry Study of DPM Levels in Underground Metal and Nonmetal Mines.'' With regard to feasibility of compliance with both the interim and final concentration limits, we concluded in the study that it may be both technologically and economically feasible for metal and nonmetal underground mines to comply with the 2001 rule. At that time, however, we acknowledged our limited in-mine documentation on implementation of DPM control technology with issues such as retrofitting and regeneration of filters. Consequently, we committed to continue to consult with the National Institute for Occupational Safety and Health, industry and labor representatives on the availability of practical mine worthy filter technology. NIOSH peer reviewed our final report of the 31-Mine Study (70 FR 32870–73).

Furthermore, by letter to MSHA dated June 25, 2003, NIOSH stated that:

> Operators will need to make informed decisions regarding filter selection, retrofitting, engine and equipment deployment, operation, and maintenance, and specifically work through issues such as in-use efficiencies, secondary emissions, engine backpressure, DPF regeneration, DPF reliability and durability. NIOSH is of the opinion that these issues can be solved if the informed decisions mentioned above are made. (70 FR 32923)

In the 2005 rulemaking on the interim limit, we revised our approach to reducing DPM levels by establishing our longstanding hierarchy of controls used for regulating our other exposure-based health standards at metal and nonmetal mines. Also, we changed the concentration limit to a permissible exposure limit whereby we measure a miner's personal exposure. The Estimator became less significant from our perspective in demonstrating feasibility since the 2005 rulemaking

record included more extensive evidence on the ability of the mining industry to meet the interim limit in 2005. Specifically, our rulemaking record included: our final report on the 31-Mine Study; NIOSH's peer review of the 31-Mine Study; results from our baseline sampling at mines covered under the DPM standard; results of our comprehensive compliance assistance work at mining operations with implementation issues affecting feasibility; NIOSH's conclusions on the performance of the SKC sampler and the availability of technology for control of DPM; NIOSH's Diesel Emissions Workshops in 2003 in Cincinnati and Salt Lake City; the Filter Selection Guide posted on the MSHA and NIOSH web sites; MSHA's final report on DPM filter efficiency; NIOSH's report titled, ''Review of Technology Available to the Underground Mining Industry for Control of Diesel Emissions'; and, the NIOSH Phase I Isozone study titled, ''The Effectiveness of Selected Technologies in Controlling Diesel Emissions in an Underground Mine—Isolated Zone Study at Stillwater Mining Company's Nye Mine,'' all of which were developed following promulgation of the 2001 DPM final rule (70 FR 32916).

To attain the interim DPM limit, mine operators are required to install, use, and maintain engineering and administrative controls to the extent feasible. When these controls do not reduce a miner's exposure to the DPM limit, controls are infeasible, or controls do not produce significant reductions in DPM exposures, operators must continue to use all feasible engineering and administrative controls and supplement them with respiratory protection. When respiratory protection is required under the final standard, mine operators must establish a respiratory protection program that meets the specified requirements. At this time, we believe that this compliance approach coupled with the time-frame for complying with the phased-in limits provides mine operators with maximum flexibility in compliance. We believe that this current compliance approach which incorporates the industrial hygiene concept of a hierarchy of controls scheme for implementing DPM controls would result in feasibility of compliance with each of the phased-in limits contained in this proposal. However, we continue to acknowledge that compliance difficulties may be encountered at some mines due to implementation issues and the cost of purchasing and installing certain types of controls.

1. MSHA's 2001 Assumptions Regarding Compliance With the Final Concentration Limit

The assumptions that we used in 2001 in support of our cost estimates included:

> (a) Fifty percent of the fleet will have new engines (these new engines do not impact cost of the rule) * * * Moreover, due to EPA [Environmental Protection Agency] regulations which will limit DPM emissions from engines used in surface construction, surface mining, and over-the-road trucks (the major markets for heavy duty diesel engines), the market for low tech ''dirtier'' engines will dry up * * * (b) one hundred percent of the production equipment and about fifty percent of the support equipment will be equipped with filters; (c) about thirty percent of all equipment will need to be equipped with environmentally controlled cabs; (d) twenty three percent of the mines would need new ventilation systems (fans and motors); (e) forty percent of the mines will need new motors on these fans; and (f) thirty two percent of the mines will need major ventilation upgrades (66 FR 5889–90).

Furthermore, we concluded that it would not be feasible to require this sector, as a whole, to lower DPM concentrations further, or to implement the required controls more swiftly (66 FR 5888).

2. Reasons Why the 2001 Assumptions Are Now Being Questioned.

During the 4½ years since the 2001 final rule was promulgated, the mining industry and MSHA have gained considerable experience with the implementation, use, and cost of DPM control technology. Miners' DPM exposures have also have declined significantly from a mean of 808_{DPM} μg/m³ (646_{TC} μg/m³ μg/m³ equivalent) prior to the implementation of the standard, to a mean of 233_{TC} μg/m³ based on current enforcement sampling. The industry, however, is encountering economic and technological feasibility issues with DPM controls as they strive to reduce levels below the interim limit. When we established the 2001 final limit, we were expecting some mine operators to encounter difficulties implementing control technology because the rule was technology forcing. We projected that by this time, practical and effective filter technology would be available that could be retrofitted onto most underground diesel powered equipment. However, as a result of our compliance assistance efforts and through our enforcement of the interim limit, we have become aware that this assumption may not be valid. The applications, engineering and related technological implementation issues that we believed would have been easily solved by now are more complex and extensive than previously thought.

Although DPF systems have been proven to be highly effective in reducing elemental carbon, mines are currently experiencing problems with selection and implementation of DPF systems for complying with the interim limit. Since the final limit will require mines to install more DPF systems, these selection and implementation problems will extend over a large portion of the mining industry. At this time we believe that solutions to the problems of selection and implementation have not proceeded as quickly as anticipated since promulgation of the 2001 final rule and many mines will not be able to achieve the final limit by January 20, 2006. Some of the implementation and operational difficulties encountered with the controls are discussed in the sections below.

We seek additional information regarding technological difficulties and whether they will increase the cost to comply with the final concentration limit above that estimated in the 2001 final rule. We are particularly interested in whether mine operators have attempted to institute DPF systems that are impractical or have failed to work for their mining operations. We wish to know what types and sizes of DPFs have been evaluated, what types of equipment have been fitted with DPFs, what types and horsepower of engines were installed on the equipment, details concerning monitoring of equipment exhaust temperatures prior to specifying a DPF for a given application, whether DPF installations include a provision for backpressure monitoring, DPF maintenance intervals, DPF life, the results of any DPF failure mode analysis, DPM reductions obtained, and any other data related to in-mine experiences with DPFs on underground metal and nonmetal mining equipment.

We believe that wider use of alternative fuels and filter technology can make the 160_{TC} μg/m³ final limit feasible if a staggered phase-in approach is adopted. By lowering the exposure limit in intervals over five years beginning in January 2007, market forces should have sufficient time and incentive to adjust to the new standard. Specifically, a reliable alternative fuel distribution system should induce mine operators to adopt this relatively low-cost method to achieve compliance. The development and distribution of alternative fuels is also encouraged by existing tax credits. We believe that regional distribution networks are

beginning to emerge. *We seek data on alternative fuel distribution systems.*

Retrofit options for self-cleaning filters should increase as the filter manufacturers become assured of a reliable market for the devices. Use of newer equipment with cleaner engines will also increase as older equipment is retired from service. We anticipate that this staggered approach will provide the needed time to resolve these logistical and operational issues, and consequently, may not increase our 2001 projection of the cost of compliance with the rule. During this phase-in, we will continue to work with the Diesel Partnership (discussed below) and the mining industry to address the DPF selection and implementation problems and identify effective solutions for the diverse metal and nonmetal mining environment.

Additionally, we request comments on the percentage of diesel equipment, by mine size, in metal and nonmetal mines that currently have newer, low DPM emitting engines such as EPA Tier I and Tier 2 compliant engines. Our 2001 cost estimates were based, in part, on the assumption that by the effective date of the final limit, 50% of the diesel equipment fleet would have new engines (66 FR 5889). *We are interested in whether our 2001 assumption was accurate.* If the percentage is lower than originally estimated, it may require the industry to rely even more heavily on filters and other types of controls at added costs. Relying on DPFs to be installed on older, higher DPM emitting engines may also introduce additional implementation issues since DPF manufacturers normally do not recommend adding DPFs to older engines. Although we recognize various types of controls that mine operators could use to reduce miner exposure to DPM, we believe that turnover in equipment to less polluting models and the use of DPFs would be the primary method of achieving compliance with the final DPM limit.

We also recognize promising advances in alternative fuel technology since the 2001 final rule was promulgated. These fuels can be extremely effective in reducing DPM emissions. Additionally, the fuels would be in tune with recent U.S. initiatives towards greater energy independence. On October 22, 2004, President Bush signed into law a 50-cent-per-gallon tax credit for producers of bio-diesel. He also extended federal tax credits for ethanol through 2007 as part of H.R. 4520, also known as the American Jobs Creation Act of 2004 (Pub. L. 108–357).

Currently, however, logistical problems exist with the distribution of these fuels to remote mining areas, and the effect of these fuels on power output and operation at high altitude needs to be addressed more fully.

Although MSHA, industry, and the Diesel Partnership are actively working to address these concerns, additional time may be needed to find effective solutions for the implementation of DPM controls.

B. Background

1. Diversity of Underground Mines Affected By the Final DPM Concentration Limit

The metal and nonmetal mining industry has 177 underground mines that use numerous pieces of diesel powered equipment, widely distributed throughout each mining operation. These mines employ an array of mining technologies to produce commodities including metals such as lead, zinc, platinum, gold, silver, etc. Also, there are different types of nonmetal mines that produce stone products such as limestone, dolomite, sandstone, and marble. Other underground nonmetal mines produce clay, potash, trona, soda ash, and salt. Not only do these mines vary in the commodities that they produce, but they also use different mine designs and mining techniques such as room and pillar mining and stope mining. Some of these mines are large, complex multilevel mines, while others are small adit-type mines. Ventilation levels in these mines also vary widely. Many limestone mines have only natural ventilation with variable air movement, whereas trona mines have high ventilation rates to dilute and remove methane gas released in the mining process. There are also deep metal mines with multiple levels that have far less ventilation than that found in underground trona mines. Furthermore, many metal and nonmetal mines are located in remote areas of the country, at high altitudes, or are subject to extremely hot or cold environments. Considering these factors as a whole, we have found that there is no single solution to control technology that would be effective for all metal and nonmetal mines in significantly reducing current DPM levels to or below the final DPM concentration limit of 160_{TC} micrograms.

2. Work of the M/NM Diesel Partnership (the Partnership)

Since promulgation of the January 2001 final rule, we have worked with a Partnership that is composed of representatives from the National Institute for Occupational Safety and Health (NIOSH), industry trade associations, and organized labor. We are not a member of the Partnership because of our ongoing DPM rulemaking activities. The primary purpose of the Partnership is to identify technologically and economically feasible controls using existing and available technology that can be retrofitted onto existing diesel powered equipment in underground metal and nonmetal mines to reduce diesel particulate matter emissions to, or below, our interim and final limits.

The Partnership has been actively involved with NIOSH in its work on diesel particulate control technology including its isolated zone studies at the Stillwater Mine in Montana. NIOSH has published the following reports of its work with the Partnership: ''The Effectiveness of Selected Technologies in Controlling Diesel Emissions in an Underground Mine—Isolated Zone Study at Stillwater Mining Company's Nye Mine (Phase I Study);'' ''An Evaluation of the Effects of Diesel Particulate Filter Systems on Air Quality and Personal Exposure of Miners at Stillwater Mining Case Study: Production Zone (Phase II Study);'' and, ''The Effectiveness of Reformulated Fuels and Aftertreatment Technologies in Controlling Diesel Emissions (Phase III—A Study in an Isolated Zone at Stillwater Mining Company's Nye Mine August 31–September 11, 2004).'' NIOSH stated in its conclusion to the Phase III study that:

> This study did not address the important critical path of economic and technical aspects relating to implementation of the studied technologies into underground mines. The successful implementation of control technologies is predicated on addressing issues which are relatively unique to each mine and even to individual applications within a given mine. Most of these technical and operational issues could be investigated through a series of long-term field studies where control technologies would be wisely selected and optimized for the applications, performance of the technologies would be continuously monitored and the effects of the controls on concentrations of diesel pollutants in the mine air would be periodically assessed. The findings of such studies would allow operators to make informed decisions regarding the selection, optimization and implementation of control technologies for its applications and maximize the benefits of using those technologies. It is recommended that these studies be designed and undertaken under the leadership of the Metal/Nonmetal Diesel Partnership.

On-going NIOSH diesel research related to the Partnership includes a contract that the NIOSH Pittsburgh Research Laboratory issued to Johnson

Matthey Catalyst to develop a system to control nitrogen dioxide (NO_2) emissions from diesel-powered underground mining vehicles equipped with the Johnson Matthey's Continuously Regenerating Trap (CRT®) system. This system promotes regeneration at lower temperatures and is widely used in urban bus applications. If the results of laboratory evaluations show that a system is suitable for use in underground mining, NIOSH would continue studying this control technology with a long-term field evaluation in an underground mine.

C. Remaining Technological Feasibility Issues

In January 2001, we concluded that technology existed to sample accurately for DPM with a TC method and to bring DPM levels to the 160 TC level by January 2006 (66 FR at 5889). We further concluded that if any particular mine found unforeseen technological barriers to meeting the January 2006 deadline, it could apply for an extension of up to two additional years to comply with the 160 limit (66 FR at 5889). Our discussion of technological feasibility in support of the interim PEL of 308_{EC} µg/m^3 in the June 6, 2005 final rule concluded that it was technologically feasible to reduce underground miners' exposures to the interim PEL by using available engineering control technology and various administrative control methods. In fact, our testing at Kennecott Minerals Green's Creek Mine showed that ceramic diesel particulate filters (DPFs) were capable of reducing diesel exposures by 95%. However, we acknowledged that compliance difficulties may be encountered at some mines due to implementation issues and the cost of purchasing and installing certain types of controls. Specifically, implementation issues may adversely affect the feasibility of using DPFs to reduce exposures despite the results reported in NIOSH's Phase I Isozone Study.

Our experience since January 2001 has raised questions on technological feasibility for the mining industry as a whole, rather than for a small number of individual mines, to meet the 160 TC concentration limit by January 20, 2006. When we conducted our baseline sampling in 2002 and 2003, we found that over 75% of the underground mines covered by the 2001 final rule have levels that would exceed the final concentration limit of 160_{TC} micrograms. Our current enforcement data indicate that approximately 65% of the underground mines covered by the 2001 final rule have levels that would exceed the final concentration limit. Although exposures have decreased with implementation of controls and enforcement of the interim concentration limit, we have tentatively concluded that the 160_{TC} microgram final concentration limit presents a significant challenge to a substantial number of underground mine operators and compliance may not be feasible by January 2006. That conclusion is supported by our current enforcement sampling results that indicate that many mining operations have exposures above the 160_{TC} concentration limit, and availability of effective control technology that will reduce exposures to the final limit is speculative at this time. Moreover, comments from industry trade associations and individual mine operators in the post-January 2001 rulemakings recommended that we repeal the 160 limit as technologically infeasible. Organized labor, on the other hand, has recommended that a limit below 160 is technologically feasible. *We request comments on whether compliance is technologically feasible by January 2006 and the appropriateness of a multi-year phase-in of the final limit. We also request comments and data on when the technology will be feasible.* Specific technological implementation issues are discussed in more detail in the following subsections C.1 through C.4.

We also request comments on whether compliance difficulties may lead to another problem by requiring a large number of miners to wear respirators until feasible controls are fully implemented. We have never had a standard that resulted in a significant percentage of the workforce being required to wear respiratory protection, and we are concerned about the impact on worker acceptance of the rule and about mine operators' ability to remain productive. *We are interested in public comment on how many miners would need to wear respirators to comply with the 2001 final limit and proposed multi-year phase-in of the final limit, and whether in each case they would need to wear respirators for their entire work shift, whether this amount of respirator usage is practical, and any other comments or observations concerning this issue.*

1. Implementation of Available DPFs

We continue to project that many mine operators will have to use DPFs to reduce DPM levels to the final concentration limit. The mining industry maintains that while some operators are using DPFs to control miners' exposures to the interim PEL, it is infeasible for them to further reduce miners' exposures through expanded use of DPFs.

While passive DPF regeneration systems are preferred over active regeneration systems, many pieces of mining equipment do not have duty cycles that will consistently support passive regeneration. Passive regeneration is the process where the exhaust gas temperature produced by the engine is sufficient to burn off the collected DPM on the DPF. Passive regeneration is normally preferred because a DPF can be installed on a machine, and the operator does not have to be concerned with removing the DPF on a routine schedule that may occur at the end of every shift. However, passive regeneration does require the machine operator to monitor the engine's exhaust gas backpressure. As the DPF loads up with DPM, the inability of the exhaust gas to burn off the DPM allows the backpressure to increase. Increasing the backpressure above the manufacturer's specifications can cause engine and DPF damage. *We request information on the number of currently installed passive regeneration DPF filters. Also, we are interested in the methods used by the industry to match a passive regeneration DPF to a machine.* However, we are aware that two identical machines operating in two different mines may not both be able to use passive regeneration. *We would be interested in comments about practical experience with these implementation issues.*

If passive regeneration is infeasible, active regeneration is an alternative. Active regeneration depends on an external heat source for burning off the DPM. Mine operators have informed us that some mining operations cannot utilize active regeneration due to physical size of filters, machine down time, or the cost associated with underground regeneration stations required for DPF regeneration. *We request that commenters submit information from the mines that are utilizing active regeneration including data regarding the benefits and the practicability of active regenerating filters.*

Engine emissions and exhaust flows also affect the size of the DPF that needs to be installed. Both of these factors can affect both passive and active regeneration. If the DPF is undersized for a particular application due to high DPM emissions or high exhaust flows, a passive or active DPF system may not make it through the entire shift before it must be taken out of service for regeneration because of the high backpressure.

While some of the mining industry has made improvements by replacing older engines with newer engines in order to reduce DPM emissions, we believe this has occurred mostly for the larger horsepower engines, greater than 150 hp. Smaller engines normally found in the support equipment have not had DPM reductions equivalent to the larger engines. Since we estimated that 50% of the support equipment would probably need DPFs for compliance with the final limit (66 FR 5889–90), the higher DPM emissions from the engines used in support equipment can further complicate the impact on compliance. The mining industry has stated that it needs additional time to further evaluate the proper sizing of DPF systems for both passive and active regeneration.

We seek further comment regarding these technological implementation issues as they affect feasibility of compliance with the final concentration limit including the practicality of available DPM control technology. We request that the mining community specifically address issues surrounding off-board regeneration: back pressure build up; frequency of the necessity to clean DPFs; the difficulty of placement of regeneration stations; and information on the extent to which diesel powered equipment accommodates a retrofit of the DPF.

2. Benefits of On-Board Regeneration

a. *ArvinMeritor® System.* The ArvinMeritor® system, which utilizes active regeneration of the DPF, offers great potential for underground mines in further reducing DPM exposures. The ArvinMeritor® system utilizes an on-board fuel burner system to regenerate DPFs. This system actively regenerates the filter media during normal equipment operations by causing the fuel to ignite the burner and thereby increase the exhaust temperature in the filter system. Consequently, this system does not require the host vehicle to travel to a regeneration station to regenerate the DPF. The condition of the DPF is monitored via sensors. While this product was successfully evaluated at Stillwater's Nye Mine, we have recently learned that the manufacturer has decided to concentrate on working with Original Equipment Manufacturers (OEMs) where they would be selling 50 units or more to one customer rather than selling one or two units per customer.

b. *Johnson Matthey's CRT® System for DPM reduction (Johnson Matthey).* As stated above, passive regeneration works by using the exhaust gas generated by the engine to burn the DPM. Normally, DPF manufacturers utilize catalyst technology to lower the temperature needed for successful passive regeneration. By lowering the exhaust gas temperature needed for passive regeneration, a broader range of machines will have the necessary duty cycle to generate the exhaust gas temperature needed to burn the DPM. However, when a platinum coating is used as the catalyst, it can also increase the nitrogen dioxide (NO_2) emissions from the engine exhaust. In mines with low ventilation rates, the increased NO_2 emissions can also result in increased NO_2 exposures to potentially dangerous levels for miners. We discuss this issue in the final rule on the interim PEL (70 FR 32924–26). Therefore, other methods for passive regeneration are being developed to resolve these issues.

In 2004, the NIOSH Pittsburgh Research Laboratory issued a contract to Johnson Matthey to develop a system that can regenerate at lower exhaust gas temperatures and control NO_2 emissions. The system is based on Johnson Matthey's CRT® system and promotes regeneration at lower temperatures. Such DPFs are widely used in urban bus applications and are capable of passively regenerating DPFs at the temperatures commonly seen in the exhausts of underground mining equipment (above 250 °C for at least 40% of the operation time).

The laboratory evaluation of the systems is being executed under NIOSH contract by the Center for Diesel Research (CDR) at the University of Minnesota. The objective is to examine performance and suitability of the systems relative to heavy-duty diesel engines in underground mining applications, with specific focus on the effectiveness of controlling NO_2. If the results of laboratory evaluations show that the system is suitable for use in underground applications, NIOSH would continue to study this promising control with a long-term field evaluation in an underground mine environment. *We request comments from the mining community regarding the foreseeable utility of these and other new control technologies for reducing DPM levels in underground metal and nonmetal mines.*

3. Operators' Limited Access to Alternative Fuels and Ultra Low-Sulphur Fuels

During our compliance assistance efforts, we observed mines with several applications of alternative fuels, including water emulsion fuels and bio-diesel fuels both of which are EPA approved fuels. We subsequently tested these alternative fuels to determine if they could decrease tailpipe DPM emissions. In each application the change to an alternative fuel had a positive impact on reducing engine emissions and miners' exposures to DPM. In some cases, reductions of 50 to 80+ percent were measured. While we found notable benefits, the use of alternative fuels can also cause equipment operation issues for mine operators. These operational issues have included initial clogging of the fuel filters when bio-diesel is used, reduction of horsepower with the use of water emulsion fuels, and management of proper fueling of the correct fuel into specific machines. While these operational issues could be overcome, each mine has to work through implementation issues on a case-by-case basis.

The most common problem with alternative fuels is lack of geographic proximity of most mines to a fuel distributor. Fuel distribution centers tend to be near large cities. As a result, alternative fuels need to be transported to mine sites, in some cases significantly increasing costs. Fuel manufacturers are building distribution centers near mining areas to reduce the transportation costs, but these centers will take some additional time to complete. Limited distribution is also a feasibility issue for metal and nonmetal mine operators who seek to obtain ultra low sulfur fuel. However, as discussed elsewhere in this preamble, the commercial availability of ultra low sulfur fuel will increase during 2006 and beyond when on-highway vehicles in the United States will be required by the EPA to use only this type of diesel fuel.

a. *Water Emulsion Fuels.* Water emulsion fuels, such as PuriNox, are blends of diesel fuels and water. The water is held in suspension with a surfactant. The water in the fuel reduces the engine combustion temperature resulting in reduced NO_2 and reduced DPM emissions. However, the added water also reduces the engine's horsepower. While the per gallon price of the water emulsion fuel is the same as standard fuel, we are aware of increases in engine consumption of these fuels by as much as 15 percent. However, continued increased use in mines is currently limited due to lack of fuel availability in most mining regions. Manufacturers of this fuel must install centralized blender facilities in order to make the fuel more available and economically feasible for use by the metal and nonmetal mining industry.

Some fuel system issues have also been observed with some engines using water emulsion fuels. One issue appears

to be with the use of very efficient water separators used on engine fuel systems to remove water from the fuel lines. A very efficient water separator will actually remove the water from the emulsion, thus affecting the engine's performance. An engine manufacturer that has experienced this with its engines has recommended replacing the more efficient water separator with a less efficient one.

Another issue identified by some mine operators is that some small machines cannot run, or run poorly, on this fuel. We are not aware of any testing that has been done to prove or disprove this. This may or may not be due to less complex fuel systems that cannot handle a change in fuel properties. *We request any information that would help a mine operator determine if certain machines in a fleet cannot run efficiently on this type of fuel.*

Since water emulsion fuels have been associated with horsepower loss, mines will have to determine through their own in-mine test if their machines can continue to operate efficiently even with the power loss. Some situations where the power loss could affect a machine's productivity occur at multilevel underground mines at high altitudes. Also, mines that require the use of permissible engines with pre-chamber combustion, such as the metal and nonmetal gassy mines, may need to determine any additional effects on these types of engines. These mines may need additional time to assess the impact of the elevation and grade on power loss. *We request comments on the mining industry's experience with using water emulsion fuels to reduce DPM exposures.*

b. *Bio-Diesel Fuels.* While bio-diesel fuels are more readily available than water emulsion fuels, there has not been a consistent supply or standard cost of the fuel. Both costs and demand for these fuels in the mining industry have been related primarily to tax credits available for using the fuel. With current tax credits, bio-diesel can be an attractive fuel alternative for the mining industry. However, we have observed maintenance issues with application of bio-diesel fuels similar to those associated with water emulsion fuels. Particularly, bio-diesel functions as a solvent and cleans the fuel system. This results in increased clogging and replacement of fuel filters. It may take the mining industry some additional time to assess the impact of the increased maintenance on a mining operation.

The other issue related to the use of bio-diesel fuel is the percent of soy oil in the mixture. While any blend is available, B20 is a 20 percent blend, and B50 is a 50 percent blend, etc., we note that significant DPM reductions are not realized unless the bio-diesel blend exceeds 20 percent. *We request comments on the mining industry's experience with using bio-diesel fuels to reduce DPM exposures.*

4. Installation of Environmental Cabs

Environmental cabs are a proven means to reduce worker exposure to DPM. While much of the construction-type equipment used in underground stone mines comes equipped with environmental cabs, the cabs on specialty mining equipment used in underground hard rock mining are less common, particularly in mines with narrow drifts or low seam heights. As mine operators realize the benefits of cabs, more and more pieces of equipment are being purchased or retrofitted with environmental cabs. These cabs provide protection for workers not only from diesel particulate but also from noise and dust.

Many mines have begun a retrofit program, but may require additional time to design and retrofit specialty mining equipment with environmental cabs. *We request comments on the mining industry's experience with using environmental cabs to reduce DPM exposures.*

V. Complexity of Developing an Appropriate Conversion Factor for the Final Concentration Limit

The June 6, 2005 rule uses a 1.3 conversion factor to convert the interim PEL of 400_{TC} µg/m^3 to 308_{EC} µg/m^3, because EC comprises only a fraction of TC. We used a factor of 1.3, to be divided into 400_{TC} µg/m^3, to produce a reasonable estimate of TC without interferences. The EC interim limit is based on the median TC to EC (TC/EC) ratio of 1.3 that was observed for valid samples in the 31-Mine Study and agreed to in the second partial DPM settlement agreement (70 FR 32944). Enforcement sample results to date have also shown that for the 400_{TC} µg/m^3 interim limit, 1.3 is the most appropriate conversion factor.

However, we believe at this time that the 1.3 conversion factor may not be appropriate to convert the final phased-in TC limits to EC because of the variety of DPM controls being adopted by mine operators since the 31-Mine Study. Depending on the types of DPM controls being installed at the mines, a new conversion factor for EC may be needed. Clean engines have more of an impact on reducing OC levels. Alternative fuels, ventilation, and work practices seem to lower EC and TC at similar rates, while DPF and environmental cabs appear to be more effective in reducing EC levels. The actual TC to EC ratio could vary from mine to mine, and even from one section in a mine to another, based on the mix of controls at a mine. We are seeking to maintain the level of protection for miners provided by the final limit promulgated by the 2001 final rule, pursuant to Section 101(a)(9) of the Mine Act. When considering the feasibility of compliance and sampling constraints, we believe that the conversion factor from TC to EC for the phased-in final limits should take into account the OC and EC ratios so that the OC and EC components together would be equivalent to a TC concentration. We are working with NIOSH to develop an appropriate conversion factor for converting the TC limits of this rulemaking to EC limits. Information provided by NIOSH indicated that the ratio of TC to EC in the 31-Mine Study is 1.25 to 1.67 (70 FR 32944). NIOSH's report on the Phase I study conducted in May, 2003, shows that the EC reduction in the isolated zone with one DPF system was 88% and that two other systems gave greater than 96% EC reductions when the measured concentrations were normalized by ventilation rate. In the final report of the Phase II study, NIOSH indicated that higher EC reductions were observed in the field than were obtained in the laboratory for whole diesel particulate. The results of these studies, as well as other mine studies NIOSH has conducted, help inform us of the EC to TC ratio at different DPM concentrations. Measuring only the EC component ensures that only diesel particulate material is being measured. However, there are no established relationships between the concentration of EC and total DPM under various operating conditions. *We welcome comments regarding the types of data we should request from NIOSH to assist us in developing an appropriate conversion factor for converting the TC limits of this proposed rule to EC limits.*

We will initiate a separate rulemaking to determine what the correct TC to EC conversion factor will be for the phased-in final limits. *In the meantime, we are interested in receiving comments on whether the record supports an EC PEL without regard to any conversion factor, the appropriate conversion factor if one is used, and any other scientific approaches for converting the existing TC limit to an appropriate EC limit.* However, if a rulemaking to establish a conversion factor is not complete before January 20, 2007, we are considering

using the current 1.3 conversion factor that we used to establish the interim DPM PEL of 308 EC micrograms to convert the phased-in final DPM TC limits to EC equivalents. As we did with the interim TC limit pursuant to the July 2002 settlement, we would use the EC equivalents as a check to validate that an overexposure is not the result of interferences. *We are interested in receiving comments on this approach to enforcement of the 2007 PEL, assuming the conversion factor rulemaking is not completed before January 20, 2007.*

VI. Economic Feasibility

In January 2001, we estimated that yearly cost of the final rule would be about 0.67% of yearly industry revenue, which was less than the 1% ''screen'' of costs relative to revenues that we use as a presumptive benchmark of economic feasibility (66 FR 5889). In this rulemaking to consider a phased-in approach to the final concentration limit of 160 TC micrograms, we intend to use the entire rulemaking record supporting the 2001 final rule and the new information gathered during the recent rulemaking to promulgate the new interim PEL. Our data in the rulemaking record established that few underground mines would experience severe economic hardship from enforcement of the interim PEL. Our subsequent enforcement data have confirmed that the interim PEL is economically feasible. In order to gain a more thorough rulemaking record, particularly in light of recent technological developments, *we request comments on the economic feasibility of the final concentration limit of 160 TC micrograms and implications of the proposed phase-in approach on the economic feasibility.*

VII. Section 101(a)(9) of the Mine Act

Section 101(a)(9) of the Mine Act provides that: ''No mandatory health or safety standard promulgated under this title shall reduce the protection afforded miners by an existing mandatory health or safety standard.'' We interpret this provision of the Mine Act to require that all of the health or safety benefits resulting from a new standard be at least equivalent to all of the health or safety benefits resulting from the existing standard when the two sets of benefits are evaluated as a whole. The U.S. Court of Appeals for the D.C. Circuit approved such a ''net effects'' application of Section 101(a)(9). *Int'l Union, UMWA* v. *Federal Mine Safety and Health Admin.,* 407 F. 3d 1250, 1256–57 (DC Cir. 2005).

We have tentatively concluded at this point that this proposed phase-in period of the effective date of existing § 57.5060(b) of the 2001 final rule establishing a final DPM concentration limit of 160_{TC} μg/m³ will not reduce miner protection. We are concerned that the final concentration limit may be infeasible for the mining industry in January 2006. Feasibility issues with respect to operator compliance are discussed above. Also, an additional concern is whether an effective sampling strategy exists to enforce the final TC concentration limits with TC as the surrogate. Evidence in the rulemaking record after January 2001 suggests that, in many cases, there is no practical sampling strategy that would adequately remove organic carbon interferences that occur when TC is used as the surrogate. Furthermore, the DPM settlement agreement does not address appropriate enforcement procedures for the final concentration limit. We also believe at this time that the 1.3 conversion factor used for the final interim limit may not be appropriate for substantially lower limits, such as the final TC concentration limit of 160_{TC} μg/m³. Thus, we have concluded at this time that it is questionable whether the final concentration limit of 160_{TC} μg/m³ would provide any more protection for miners than the 308_{EC} μg/m³ interim limit. We have the burden of proof to confirm that an overexposure to DPM actually occurred and the sample result is not due to interferences. If we were to enforce the final DPM concentration limit of 160_{TC} μg/m³, we would need to validate a TC sample result, which cannot be done without an appropriate conversion factor for EC.

We request comments on whether a five-year phase-in period for lowering the final concentration limit to 160_{TC} μg/m³ complies with Section 101(a)(9) of the Mine Act.

VIII. Section-by-Section Discussion of the Proposed Rule

A. Section 57.5060(b)

Section 57.5060(b) in the 2001 rule established a final concentration limit of 160_{TC} μg/m³ to become effective after January 19, 2006. In this rulemaking, we propose to stagger the effective dates for implementation of the final DPM limit, phased-in over a five year period. In a separate rulemaking, we will propose changing the phased-in limits from TC to EC. As previously discussed in Section IV, Technological Feasibility, issues have surfaced since promulgation of the 2001 final rule that indicate the mining industry, taken as a whole, may need additional time to address implementation issues. We are still committed to ensuring that mine operators continue the significant progress they have already demonstrated in reducing miners' exposures to DPM. As a first step in revising the final concentration limit, we are proposing the interim PEL of 308 micrograms to remain in effect until January 20, 2007, based on feasibility concerns with respect to compliance and sampling strategy discussed above. *MSHA is interested in whether the mining community believes at this time that a reduction, after that date, of the PEL equivalent by 50_{TC} μg/m³ each year from 400_{TC} μg/m³, is feasible and will provide additional time for the implementation of controls and development of distribution systems for alternative fuels. We also request information and comments on mining industry current experiences with feasibility of compliance with a limit lower than the current interim PEL of 308 μg/m³ of elemental carbon (EC).*

The proposed rule would establish the existing interim PEL of 308_{TC} μg/m³ as the new final PEL for one year until January 20, 2007, and impose limits that are reduced by what we will determine in a separate rulemaking to be the equivalent of 50 micrograms of total carbon from 400_{TC} μg/m³ each succeeding year until the final PEL of 160_{TC} μg/m³ is reached in 2011. Consistent with the 2005 final rule on the interim limit, we propose to change the final limit from a concentration limit to a PEL. *We request comments on whether five years is the correct timeframe for reducing miners' exposures to the 160 micrograms of TC as originally established in the 2001 standard and to have been effective in January 2006. Also, we request information on whether the proposed annual 50 microgram reductions of the final DPM limit are appropriate or, in the alternative, should the final rule include an approach such as one or two reductions.*

We intend that the provisions regarding extensions of time in which to meet the final concentration limit pursuant to existing § 57.5060(c) would apply to the limits established in proposed § 57.5060(b) effective January 20, 2006. If a mine requires additional time to come into compliance with the revised limit of 308 EC for the first year as in proposed § 57.5060(b)(1) or with the final DPM limit established in any other paragraph of proposed § 57.5060(b) due to technological or economic constraints, the operator of the mine could file an application with our District Manager for a special extension. *We request your comments on the impact of granting extensions for*

compliance with exposure limits that are greater than the 160 TC final limit.

We intend to cite a violation of the DPM exposure limit only when we have solid evidence that a violation actually occurred. Accordingly, we would continue to determine that an overexposure has occurred when a sample exceeds the interim limit using an appropriate error factor. The appropriate error factor would be slightly different for each of the reduced PELs. Our error factor model accounts for both intra- and inter-laboratory analytical variability and combines that variability with variability in pump flow rate and other sampling and analytic variables. The appropriate error factors will be based on the same statistically sound paired-punch database as used for the existing exposure limit. When developed, they will be further discussed on our Web site at *http://www.msha.gov* under, ''Single Source Page for Metal and Nonmetal Diesel Particulate Matter Regulations.''

B. Effect of Eliminating § 57.5060(c)(3)(i)

The 2001 final rule included a requirement at § 57.5060(c)(3)(i) specifying that applications for a one-year special extension in which to comply with the final DPM concentration limit of 160 micrograms of TC include information adequate for the Secretary to ascertain that diesel-powered equipment was used in the subject mine prior to October 29, 1998. In our 2005 rule addressing the interim limit, we revised the extension provisions, but we retained the October 29, 1998 factor for our District Manager to consider in granting extensions. The basis for limiting special extensions to underground mines that operated diesel-powered equipment prior to October 29, 1998 was that we released our NPRM of our 2001 final rule on that date. We reasoned that some mines in operation prior to that date could experience compliance difficulties relating to such factors as the basic mine design, use of older equipment with high DPM emissions, etc., and that as a result, some of these mines may require additional time to attain compliance with the final DPM limit. Also, we envisioned that mines opened after that date would be using cleaner engines that would greatly benefit them in complying with the 2001 final concentration limit. Now, we believe that our assumptions were incorrect.

We now believe that it is unnecessary to limit the application of extensions to mines operating diesel equipment prior to October 29, 1998, because under current § 57.5060(c), it is voluntary as to whether a mine operator applies for a special extension. Extensions involve paperwork which result in a document that a mine operator can rely on for one year (renewable) to show our inspectors that we have determined that it is technologically or economically infeasible at this time for that particular mine operator to achieve compliance with the final limit using engineering and administrative controls. If their miners are wearing respirators, they are in compliance and no citation is issued. This is exactly the same test and the same result under § 57.5060(d) at mines without a formal extension. Under the current rule, mine operators must use all feasible engineering and administrative controls to achieve compliance. If we determine that reaching the final limit is infeasible for technological or economic reasons, and over-exposed miners are in respirators, the operator is deemed to be in compliance and no citation is issued. We will periodically check to determine current DPM exposures and the ability of the mine operator to implement new control technology.

We request comments on the benefits of current § 57.5060(c)(3)(i), and the effects of deleting the requirement, along with the number of miners that would be affected if § 57.5060(c)(3)(i) were eliminated. We also request comments on whether the elimination of § 57.5060(c)(3)(i) would result in a reduction in the current level of health protection afforded to miners.

IX. Medical Evaluation and Transfer

We believe that the phase-in approach of this proposed rule for ultimately reducing miners' exposures to 160 micrograms of total carbon will resolve many of the existing feasibility issues related to effectively implementing more engineering and administrative controls in metal and nonmetal underground mines to enhance miners' health. Consequently, fewer miners would be required to wear a respirator to supplement feasible engineering and administrative controls. Whereas most mines can feasibly comply with the existing DPM interim PEL of 308 micrograms of elemental carbon, we expect that some miners will continue to have to wear respirators. With each lower limit, more miners may have to wear respirators for longer time periods until controls become feasible. In the event that miners cannot wear a respirator, existing § 57.5060(d) allows for the use of an air purifying respirator, such as those that are integrated into a hardhat. We believe that such respirators are an effective option under the interim PEL for persons who cannot wear a negative-pressure respirator.

We are interested in comments from the mining community on whether we should include in the final rule, pursuant to Section 101(a)(7) of the Mine Act, a provision requiring a medical evaluation to determine a miner's ability to use a respirator before the miner is fit tested or required to work in an area of the mine where respiratory protection must be used under the final limits. In addition, we are seeking comments on whether the final rule should contain a requirement for transfer of a miner to an area of the mine where respiratory protection is not required if a medical professional has determined in the medical evaluation that the miner is unable to wear a respirator for medical reasons.

Currently, our standards do not require medical transfer of metal and nonmetal miners. *We are interested in whether the public believes that we should amend the existing respiratory protection requirement at § 57.5060(d) by adding new paragraphs (d)(3) and (d)(4) that would address medical evaluation and transfer rights for miners. We particularly want to know if the final rule should include the following language:*

(3) The mine operator must provide a medical evaluation, at no cost to the miner, to determine the miner's ability to use a respirator before the miner is fit tested or required to use the respirator to work at the mine.

(4) Upon notification from the medical professional that a miner's medical examination shows evidence that the miner is unable to wear a respirator, the miner must be transferred to work in an existing position in an area of the same mine where respiratory protection is not required.

(i) The miner must continue to receive compensation at no less than the regular rate of pay in the classification held by that miner immediately prior to the transfer.

(ii) The miner must receive wage increases based upon the new work classification.

We also solicit comments from the public as to whether a transfer provision in the final rule should address issues of notification to the District Manager of the health professional's evaluation and the fact that a miner will be transferred; the appropriate timeframe within which the transfer must be made; whether a record of the medical evaluation conducted for each miner should be maintained along with the correct retention period; medical confidentiality; and any other relevant issues such as costs to mine operators for implementing a rule requiring medical evaluations and transfer of miners.

We preliminarily estimate that medical evaluation and transfer requirements, as described above in

proposed § 57.5060(d)(3) and (3)(4), would affect about 50 miners annually for evaluation, about 3 miners annually for transfer, and cost about $40,000 annually.

X. Regulatory Impact Analysis

A. Executive Order 12866

Executive Order 12866 requires regulatory agencies to assess both the costs and benefits of regulations. In making this assessment, we determined that this final rule will not have an annual effect of $100 million or more on the economy, and therefore is not an economically significant regulatory action as defined by § 3(f)(1) of E.O. 12866.

B. Costs

In Chapter IV of the Regulatory Economic Analysis in support of the January 19, 2001 final rule (2001 REA), we estimated total yearly costs to underground M/NM mines for the DPM final rule of $25,149,179 (p. 106). Of this amount, $6,612,464 was the discounted incremental yearly cost of compliance with the final limit. The undiscounted incremental yearly cost for compliance with the final limit was estimated as $9,274,325 (p. 58).[1]

This proposed rule would amend the January 19, 2001 final DPM rule by phasing in the 160_{TC} µg/m^3 final limit over a five-year period to address technological feasibility constraints that have arisen. The discounted present value of the cost saving from this five-year phase-in period would be $25,512,045, if compliance with the 160_{TC} µg/m^3 final limit were technologically feasible in 2006. The annualized value of this cost saving, using a discount rate of 7%, would be $1,785,843. Table X–1 shows these calculations and also shows the breakdown of these cost savings by mine size.

During the 4½ years since the 2001 final rule was promulgated, the mining industry and MSHA have gained considerable experience with the implementation, use, and cost of DPM control technology, which could result in cost changes. Therefore, *we solicit public comment concerning the cost of compliance, including any changes in costs that may have occurred since the 2001 REA.*

Table X-1. Incremental Yearly Cost of 160_{TC} µg/m^3 Final Limit Relative to 400_{TC} (308_{EC}) µg/m^3 Interim Limit & Projected Cost Savings from Proposed 5-year Phase-In of 160_{TC} µg/m^3 Final Limit

Year	Yearly Costs of No Phase-In	TC Limit (µg/m^3)	Percent of Phase-In	Yearly Costs of Phase-In	Yearly Cost Saving	Discount Factor	Discounted Cost Saving
2006	$9,274,325	400	0%	$0	$9,274,325	1.0000	$9,274,325
2007	$9,274,325	350	20%	$1,854,865	$7,419,460	0.9346	$6,934,075
2008	$9,274,325	300	40%	$3,709,730	$5,564,595	0.8734	$4,860,333
2009	$9,274,325	250	60%	$5,564,595	$3,709,730	0.8163	$3,028,245
2010	$9,274,325	200	80%	$7,419,460	$1,854,865	0.7629	$1,415,068
2011	$9,274,325	160	100%	$9,274,325	$0	0.7130	$0
2012	$9,274,325	160	100%	$9,274,325	$0	0.6663	$0
2013	$9,274,325	160	100%	$9,274,325	$0	0.6227	$0
2014	$9,274,325	160	100%	$9,274,325	$0	0.5820	$0
2015	$9,274,325	160	100%	$9,274,325	$0	0.5439	$0
					Sum of Discounted Cost Savings:		$25,512,045
					Annualized Value of Cost Savings (Mines with over 500 employees):		$164,972
					Annualized Value of Cost Savings (Mines with 20 to 500 Employees):		$1,156,122
					Annualized Value of Cost Savings (Mines with under 20 Employees):		$464,746
					Annualized Value of Cost Savings (All Underground M/NM Mines):		$1,785,843

C. Benefits

In Chapter III of the Regulatory Economic Analysis in support of the January 19, 2001 final rule (2001 REA), we demonstrated that the DPM final rule for M/NM mines will reduce a significant health risk to underground miners. This risk included the potential for illnesses and premature death, as well as the attendant costs of the risk to the miners' families, to the miners' employers, and to society at large.

We have incorporated into this rulemaking record the previous DPM rulemaking records, including the risk assessment to the January 19, 2001 standard. Benefits of the January 19, 2001 final rule include continued reductions in lung cancers. In the long run, as the mining population turns over, we estimated that a minimum of 8.5 lung cancer deaths will be avoided per year. We noted that this estimate was a lower bound figure that could significantly underestimate the magnitude of the health benefits. For example, the estimate based on the mean value of all the quantitative estimates examined in the January 19, 2001 final rule was 49 lung cancer deaths avoided per year.

[1] The following section, discussing benefits of the proposed rule, notes that MSHA's original estimate, in 2001, of the benefits of the final limit assumed that mean miner exposure to DPM was larger than that observed in subsequent sampling of baseline and current DPM concentrations experienced by underground M/NM miners. To the extent that benefits were accordingly overestimated in 2001, we expect that the 2001 estimates of cost impacts may have been inflated similarly.

Other benefits noted in the 2001 REA were reductions in the risk of premature death from cardiovascular, cardiopulmonary, or respiratory causes and reductions in the risk of sensory irritation and respiratory symptoms. However, we did not include these health benefits in its estimates because we could not make reliable or precise quantitative estimates of them. Nevertheless, we noted that the expected reductions in the risk of death from cardiovascular, cardiopulmonary, or respiratory causes and the expected reductions in the risk of sensory irritation and respiratory symptoms are likely to be substantial. *You are encouraged to submit additional evidence of new scientific data related to the health risk to underground metal and nonmetal miners from exposure to DPM.*

The 2001 risk assessment used the best available data on DPM exposures at underground M/NM mines to quantify excess lung cancer risk. ''Excess risk'' refers to the lifetime probability of dying from lung cancer during or after a 45-year occupational DPM exposure. This probability is expressed as the expected excess number of lung cancer deaths per thousand miners occupationally exposed to DPM at a specified mean DPM concentration. The excess is calculated relative to baseline, age-specific lung cancer mortality rates taken from standard mortality tables. In order to properly estimate this excess, it is necessary to calculate, at each year of life after occupational exposure begins, the expected number of persons surviving to that age with and without DPM exposure at the specified level. At each age, standard actuarial adjustments must be made in the number of survivors to account for the risk of dying from causes other than lung cancer. Occupational exposure is assumed to begin at age 20 and to continue, for surviving miners, until retirement at age 65. The accumulation of lifetime excess risk continues after retirement through the age of 85 years.

Table X–2, taken from the 2001 risk assessment, shows a range of excess lung cancer estimates at mean exposures equal to the interim and final DPM limits. The eight exposure-response models employed were based on studies by Säverin *et al.* (1999), Johnston *et al.* (1997), and Steenland *et al.* (1998). Assuming that TC is 80 percent of whole DPM, and that the mean ratio of TC to EC is 1.3, the interim DPM limit of 500 μg/m^3 shown in Table X–2 corresponds to the 308 μg/m^3 EC surrogate limit adopted under the June 6, 2005 rulemaking.

TABLE X–2.—EXCESS LUNG CANCER RISK EXPECTED AT SPECIFIED DPM EXPOSURE LEVELS OVER AN OCCUPATIONAL LIFETIME (EXTRACTED FROM TABLE III–7 OF THE 2001 RISK ASSESSMENT).

Study and statistical model	Excess lung cancer deaths per 1000 occupationally exposed workers †	
	Final DPM limit 200 μg/m^3	Interim DPM limit 500 μg/m^3
Säverin *et al.* (1999)		
Poisson, full cohort	15	44
Cox, full cohort	70	280
Poisson, subcohort	93	391
Cox, subcohort	182	677
Steenland *et al.* (1998)		
5-year lag, log of cumulative exposure	67	89
5-year lag, simple cumulative exposure	159	620
Johnston *et al.* (1997)		
15-year lag, mine-adjusted	313	724
15-year lag, mine-unadjusted	513	783

† Assumes 45-year occupational exposure at 1920 hours per year from age 20 to retirement at age 65. Lifetime risk of lung cancer adjusted for competing risk of death from other causes and calculated through age 85. Baseline lung cancer and overall mortality rates from NCHS (1996).

As explained in the June 6, 2005 final rule, the mean DPM concentration levels estimated from both the 31-Mine Study (432–492 μg/m^3, depending on whether trona mines are included) and the baseline samples (≈320 μg/m^3) fall between the interim and final DPM limits shown in Table X–2. All of the exposure-response models shown are monotonic (*i.e.,* increased exposure yields increased excess risk, though not proportionately so). Therefore, using the most current available estimates of mean exposure levels, they all predict excess lung cancer risks somewhere between those shown for the interim and final limits. Thus, despite substantial improvements apparently attained since the 1989–1999 sampling period addressed by the 2001 risk assessment, underground M/NM miners are still faced with an unacceptable risk of lung cancer due to their occupational DPM exposures.

Another principal conclusion of the 2001 risk assessment was:

> By reducing DPM concentrations in underground mines, the rule will substantially reduce the risks of material impairment faced by underground miners exposed to DPM at current levels.

Although DPM levels have apparently declined since 1889–1999, MSHA expects that further improvements will continue to significantly and substantially reduce the health risks identified for miners. There is clear evidence of DPM's adverse health effects, not only at pre-2001 levels but also at the generally lower levels currently observed at many underground mines. These effects are material health impairments as specified under § 101(a)(6)(A) of the Mine Act. From the recent enforcement sample results, 135 out of the 183 mines (73.8%) had at least one sample exceeding the final exposure limit. Because the exposure-response relationships shown in Table X–2 are monotonic, MSHA expects that industry-wide implementation of the interim limit will significantly reduce the risk of lung cancer among miners.

This proposed rule would amend the January 19, 2001 final DPM rule by phasing in the final limit over a five-year period to address technological feasibility constraints that have arisen. By addressing the technological feasibility issues in this way, this proposed rule would contribute to the

realization of the benefits mentioned above.

XI. Regulatory Flexibility Act Certification

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, we must use the Small Business Act definition of a small business concern in determining a rule's economic impact unless, after consultation with the SBA Office of Advocacy, and after opportunity for public comment, we establish a definition which is appropriate to our activities and publish that definition in the **Federal Register**. For the mining industry, SBA defines ''small'' as having 500 or fewer workers. We have traditionally considered small mines to be those with fewer than 20 workers.

To ensure that the rule conforms to the RFA, we analyzed the economic impact on mines with 500 or fewer workers and also on mines with fewer than 20 workers. In Chapter V of the 2001 REA we estimated yearly revenues for these mine sizes. In Table X–1 of this preamble, we estimate the cost savings to mines of various employment sizes. In Table XI–1 of this preamble we combine these numbers and calculate cost savings as a percentage of revenues. Cost savings are 0.25% of revenues for mines with fewer than 20 employees and 0.06% of revenues for mines with 500 or fewer employees. Since both cost savings calculations are less than one percent of revenues, there is no need to conduct an initial regulatory flexibility analysis. *We solicit public comment concerning the accuracy of these cost estimates.*

We certify that the rule will not have a significant economic impact on a substantial number of small entities under either definition.

Table XI-1. Estimated Yearly Cost Savings of Proposed Rule Relative to Yearly Revenues For Underground M/NM Mines That Use Diesel-Powered Equipment

Mine Size	Proposed Rule Yearly Cost Savings	Yearly Revenues	Cost Savings as Percentage of Revenues
Fewer than 20 Employees	$464,746	$189,305,000	0.25%
500 or Fewer Employees	$1,620,869	$2,745,137,000	0.06%

XII. Paperwork Reduction Act

There are no paperwork provisions in this proposed rule.

XIII. Other Regulatory Considerations

A. National Environmental Policy Act of 1969

We have reviewed this proposed rule in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), the regulations of the Council on Environmental Quality (40 U.S.C. part 1500), and the Department of Labor's NEPA procedures (29 CFR part 11).

This proposed rule would have no significant impact on air, water, or soil quality; plant or animal life; the use of land; or other aspects of the human environment. As a result of this environmental assessment, we find that the proposed rule would have no significant impact on the human environment. Accordingly, we have not provided an environmental impact statement. *We solicit public comment concerning the accuracy and completeness of this environmental assessment.*

B. The Unfunded Mandates Reform Act of 1995

This proposed rule does not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments, nor would it increase private sector expenditures by more than $100 million annually, nor would it significantly or uniquely affect small governments. Accordingly, the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 *et seq.*) requires no further agency action or analysis.

C. The Treasury and General Government Appropriations Act of 1999: Assessment of Federal Regulations and Policies on Families

This proposed rule would have no affect on family well-being or stability, marital commitment, parental rights or authority, or income or poverty of families and children. Accordingly, Section 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. 601 note) requires no further agency action, analysis, or assessment.

D. Executive Order 12630: Government Actions and Interference With Constitutionally Protected Property Rights

This proposed rule would not implement a policy with takings implications. Accordingly, Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, requires no further agency action or analysis.

E. Executive Order 12988: Civil Justice Reform

This proposed rule was written to provide a clear legal standard for affected conduct and was carefully reviewed to eliminate drafting errors and ambiguities, so as to minimize litigation and undue burden on the Federal court system. Accordingly, this proposed rule would meet the applicable standards provided in Section 3 of Executive Order 12988, Civil Justice Reform.

F. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This proposed rule would have no adverse impact on children. Accordingly, Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, as amended by Executive Orders 13229 and 13296, requires no further agency action or analysis.

G. Executive Order 13132: Federalism

This proposed rule would not have ''federalism implications,'' because it 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.'' Accordingly, Executive Order 13132,

Federalism, requires no further agency action or analysis.

H. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This proposed rule would not have ''tribal implications,'' because it would not ''have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.'' Accordingly, Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, requires no further agency action or analysis.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

Regulation of the metal/nonmetal sector of the mining industry has no significant impact on the supply, distribution, or use of energy. This proposed rule is not a ''significant energy action,'' because it would not be ''likely to have a significant adverse effect on the supply, distribution, or use of energy * * * (including a shortfall in supply, price increases, and increased use of foreign supplies).'' Accordingly, Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, requires no further agency action or analysis.

J. Executive Order 13272: Proper Consideration of Small Entities in Agency Rulemaking

We have thoroughly reviewed this proposed rule to assess and take appropriate account of its potential impact on small businesses, small governmental jurisdictions, and small organizations. As discussed in Section XI of this preamble, we have determined and certified that this proposed rule would not have a significant economic impact on a substantial number of small entities. Accordingly, Executive Order 13272, Proper Consideration of Small Entities in Agency Rulemaking, requires no further agency action or analysis.

XIV. Proposed Rule Text

List of Subjects in 30 CFR Part 57

Diesel particulate matter, Metal and nonmetal, Mine safety and health, Underground miners.

Dated: September 1, 2005.

David G. Dye,

Deputy Assistant Secretary of Labor for Mine Safety and Health.

For reasons set forth in the preamble, we propose to amend Chapter 1 of Title 30 as follows:

PART —57 [AMENDED]

1. The authority citation for part 57 reads follows:

Authority: 30 U.S.C. 811

2. Section 57.5060 is amended by revising paragraph (b) and removing paragraph (c)(3)(i) to read as follows:

§ 57.5060 Limit on exposure to diesel particulate matter.

* * * * *

(b)(1) Effective January 20, 2006, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 308 micrograms of elemental carbon per cubic meter of air (308_{EC} $\mu g/m^3$).

(2) Effective January 20, 2007, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 350 micrograms of total carbon per cubic meter of air (350_{TC} $\mu g/m^3$).

(3) Effective January 20, 2008, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 300 micrograms of total carbon per cubic meter of air (300_{TC} $\mu g/m^3$).

(4) Effective January 20, 2009, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 250 micrograms of total carbon per cubic meter of air (250_{TC} $\mu g/m^3$).

(5) Effective January 20, 2010, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 200 micrograms of total carbon per cubic meter of air (200_{TC} $\mu g/m^3$).

(6) Effective January 20, 2011, a miner's personal exposure to diesel particulate matter (DPM) in an underground mine must not exceed an average eight-hour equivalent full shift airborne concentration of 160 micrograms of total carbon per cubic meter of air (160_{TC} $\mu g/m^3$).

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