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Mr. Marvin Nichols, Director
Office of Standards, Variances And Regulations
MSHA
1100 Wilson Boulevard, Room 2350
Arlington, VA 22209

Re: MSHA Diesel Particulate Matter (DPM) Standards For Underground M/NM Mines

Dear Mr. Nichols:

The MARG Coalition¹ appreciates this opportunity to submit comments in response to the re-opening of the rulemaking record on MSHA's diesel particulate matter (DPM) rules, announced in the Federal Register on February 20, 2004 (69 FR, page 7881). We urge MSHA to conclude this proceeding as quickly as possible, including adopting the changes we endorsed in our prior comments. Most importantly, we again urge MSHA to act now, in this rulemaking, to delete and revoke the January 2006 permissible exposure limit (PEL) of 160 ug/m³ total carbon (TC) and adopt the 308 ug/m³ elemental carbon (EC) "settlement" standard, as the permanent standard for the control of DPM in underground metal and non-metal mines.

This rulemaking results from the interim partial settlement agreement, dated July 15, 2002 (Interim Settlement), of our legal challenge to the January, 19, 2001 DPM rule; a rule that was rushed to publication on the last day of an outgoing Administration. The Interim Settlement acknowledged the need to address the gross errors in the rule, including the selection of an invalid DPM measurement surrogate and the erroneous feasibility and validity determinations underlying the 2002 and 2006 standards.

Based on this agreement and reserving their positions and litigation rights, the Agency committed to an expedited rulemaking that would adopt needed changes, and the industry agreed to a July 2003 implementation of a 308 EC standard, including provisions for renewable, one year feasibility based extensions, and the use of personal protective equipment and administrative

¹ The MARG Coalition is composed of: Cargill, Carmeuse Lime, FMC, General Chemical, IMC, Morton Salt, Newmont Mining, Stillwater Mining and the National Mining Association. MARG is also supported by contributions from the National Stone Sand and Gravel Association and other mining and manufacturing companies and associations interested in the safe and essential use diesel powered equipment.

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controls. Additional compliance assistance, research and technical feasibility efforts were also agreed to in the Interim Settlement.

Almost two years have passed since the Interim Settlement without concluding this critical “expedited” rulemaking, leaving agency personnel, mine operators and employees to struggle with implementation and feasibility issues² without the benefit of most of the critical changes envisioned by the Interim Settlement. As predicted by industry comments and confirmed by MSHA’s compliance assistance sampling, MSHA DPM enforcement sampling now is producing significant compliance issues with the 308 EC standard. Most importantly, the January 2006 deadline for the 160 TC standard is rapidly approaching without a regulatory resolution in place.

Unfortunately, the rule rushed to publication on January 19, 2001, did not have a sound scientific, engineering, or economic basis, and work that should have been completed prior to the adoption of the rule is only available now, after its adoption, and reflected in the new documents in this rulemaking record. The Mine Act places research responsibility with the National Institute of Occupational Safety and Health (NIOSH), and that agency was in the midst of conducting essential DPM research when the premature rule was adopted on January 19, 2001. In fact, the MSHA adoption ignored the express instruction from the United States Congress that the DPM rulemaking should be informed by NIOSH research.

The new documents in the record again demonstrate that there is neither scientific support nor a feasible means of compliance for the 2006 160 TC standard. The new documents,

² Throughout the rulemaking, MARG comments stressed the lack of technical and economic feasibility of the premature rules and MSHA’s refusal to conduct a real world analysis of feasibility. While MSHA’s rulemaking feasibility analysis used yet to be developed and unproven hypothetical controls, applied through an “Estimator” of DPM reductions that used false assumptions of perfect ventilation and manufacturer promises of diesel filter effectiveness, the industry stressed the real world lack of controls for the existing fleet of equipment. Reality was again confirmed by the NIOSH Isozone Study report:

“The majority of current knowledge on the performance of the diesel particulate filter (DPF) systems and other control technologies is based on studies done under laboratory conditions, the results then being applied to on-highway vehicles. According to the best knowledge of the authors, only two comprehensive studies that were conducted recently at Noranda’s Bathurst Mining and Smelting Mine and International Nickel Company’s Stobie Mine under the sponsorship of the Diesel Emissions Evaluation Program [McGinn 2001, Bugarski and Schnakenberg 2001, Bugarski and Schnakenberg 2002] offered some insight into the problems associated with the deployment of modern DPFs to underground mining vehicles.” NIOSH Isozone, Phase One Study at 1.

Interestingly, even the limited feasibility research applicable to mining equipment was published after the premature January 19, 2001 rule.

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like the rest of the rulemaking record, require that MSHA: (1) delete and revoke the January 2006 160 microgram total carbon PEL³; (2) adopt a renewable, one year compliance extension application process for the 308 EC standard based on feasibility issues⁴; and (3) apply existing regulation and policy to the DPM rule to permit the use of personal protective equipment and administrative controls for employee protection.

Stillwater Study – Phase 1 Report and Phase 2 Case Study Report Comments

The first document submitted for the record on which MSHA seeks comments presents the results of in-mine testing of diesel particulate matter (DPM) control technologies at the Stillwater Mining Company Nye Mine. Stillwater, like other MARG members, provided its facilities, personnel, and resources to the NIOSH Metal/Nonmetal Diesel Partnership, which includes MARG, and in which MSHA personnel participated.

First, we again thank Stillwater and NIOSH for their extensive efforts. While all users of underground diesel powered equipment have initiated processes to reduce DPM concentrations, Stillwater's contribution to developing an overall understanding of Diesel Particulate Filter (DPF) technology is invaluable.

As reflected in the report, the objective of the Phase 1 Study, conducted in an isolated zone ("Isozone") of the Stillwater Mine, was to determine the "viability of DPF systems and establish confidence in their performance." The first specific and detailed comments we submit

³ The Interim, Partial Settlement Agreement permitted the implementation of the 308 EC "settlement" standard, but the parties reserved their rights to peruse the court challenge of the entire rule if a complete settlement is not reached. From that perspective, we note that the same scientific and engineering information rendering the 160 TC standard invalid also applies to the prior 400 TC standard, and the new 308 EC settlement standard. While MARG has indicated its willingness to accept the 308 EC settlement standard, that agreement is contingent on a successful resolution of this rulemaking.

⁴ The need for additional DPF feasibility research is evident from the Isozone Study Report: "This short-term study addressed some issues related to the selection and installation of filtration systems, but was not able to address other important issues related to the implementation and operation of DPFs, namely regeneration of DPF systems during the production cycle, their reliability and durability. Addressing these issues will require long-term studies with continuous monitoring of performance of the DPF systems and periodic emissions testing." NIOSH Isozone Study at 2. The NIOSH, Phase 2 Case Study reached the same conclusion: that further research was needed to develop safe and feasible controls: "Due to the nature of the study, Phase II did not address other and no less important matters related to implementation of DPM control technologies in underground mines. These matters include selection of DPF regeneration strategies, economic, logistical, and technical feasibility of implementation of various DPF systems on mining vehicles, and the reliability and durability of the systems in mine settings. Addressing those matters would require a different and more comprehensive type of feasibility study yet to be performed." NIOSH Isozone Study at 4.

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for the record regarding this Phase 1 Report is the NIOSH April 1, 2004 Phase 2 Report (Case Study) (Attachment 1), which we provide for inclusion in the record.

The isolated-zone created for the Phase 1 test was an underground laboratory not reflective of actual mining conditions. The results obtained in the isolated-zone test are applicable to the limited equipment that could be fitted with DPFs and are not representative of actual mining conditions, nor of the complete fleet⁵ of equipment in use at Stillwater or in the metal/non metal industry. Yet, the Phase 1 Study partially fulfilled its objective and demonstrated that, as tested in the isolated-zone setting on the limited equipment capable of using the DPF systems, the systems were capable of reducing DPM, including EC.

Thus, the isolated zone test demonstrated a *potential* feasible control system, for a small fraction of the equipment in use that remained to be tested under actual mining conditions. The results do not demonstrate that feasible controls exist to achieve compliance with the current or pending MSHA PEL, but provided the first steps towards examining the actual feasibility of compliance that should have been taken long before the DPM rule was rushed to publication.

As reflected in the introduction of the Phase 1 Final Report, the partnership committed to a second phase of testing to “assess the effectiveness of diesel particulate filters in controlling the exposure of underground miners in actual production scenarios.” The Case Study, Phase 2 report explains and applies the lessons of the Phase 1 Study and provides critical safety and feasibility information regarding the use of DPF systems in actual mining conditions. The Case Study Phase 2 Report of the NIOSH Partnership, conducted with full participation by MSHA representatives, is essential to the completion of this regulatory proceeding and also should have been conducted prior to the adoption of the DPM rules.

The Case Study demonstrates the extreme difficulty of achieving compliance with the 308 EC PEL, the severe hazards to miners that can be created by DPFs (particularly if compliance experiments are mandated through field enforcement), and the lack of a feasible means to comply with the 2006 160 ug/m³ TC PEL.

The Phase 2 Case Study demonstrates the technologic limitations that mines will encounter during attempted DPM reduction efforts in the actual mining cycle. Equipment failures and performance below that obtained during the isolated zone testing, and below that

⁵ The NIOSH Phase 2 Case Study corrects a misimpression created by the Phase 1, Isozone Report that the equipment tested represented the entire fleet of diesel equipment at the mine. In fact, the equipment tested represented only a small fraction of the entire fleet that could be physically fitted with DPFs or had engine characteristics that were required by the manufacturers for DPF use.

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advertised by manufacturers, were commonplace and will be repeated as these technologies are deployed elsewhere. Indeed, the report notes,

“the efficiencies for the DPF systems achieved in the mining studies did not always agree with the efficiencies reported in the laboratory studies. These studies also demonstrated that considerable effort is needed to select and optimize DPF systems for individual underground mining applications.”

Moreover, the Phase 2 test could only include those pieces of equipment for which a DPF system could be retrofitted. Importantly, this category represented only a small fraction of Stillwater’s underground diesel fleet, leaving the vast majority of the fleet to future controls that have yet to be developed or tested, or to premature replacement, an economic threat never intended, envisioned or analyzed by the DPM rulemaking.

The inherent assumption underlying the January 19, 2001 DPM rules, the MSHA feasibility analysis, and the MSHA “Estimator” used to analyze the rules, was that effective and inexpensive DPFs were available and could be readily retrofitted to the mining fleet to achieve compliance with the 2002 and 2006 PELs. That basic assumption, severely criticized by independent engineering experts during the prior phase of this rulemaking, was proven wrong, again, by the Stillwater tests:⁶

⁶ We note that after the Phase 2 Case Study, MSHA representatives informally criticized the NIOSH Partnership testing for its use of DPF systems with on board regeneration capability, instead of testing DPFs that regenerate with off board systems. Such after the fact criticism is invalid and ignores the reality of the equipment in use and the mining conditions at Stillwater. Off board regeneration DPF systems would require the installation and construction of regeneration stations at strategic locations throughout the mine. The use of such off board systems would also require that the hundreds of units of diesel powered equipment travel to the regeneration stations, park and await their turn for filter regeneration. The construction and installation of such off board systems would necessitate mining new openings to accommodate the installations, and mining new parking areas for the equipment that would have to gather for regeneration of their filters. Stillwater’s underground roof control plans carefully dictate the width of openings for safe design to minimize the risk of dangerous roof falls. Re-mining stable areas to create new larger openings for parking and regeneration locations would create unacceptable ground control risks. Moreover, the time, costs, logistics and safety concerns of moving hundreds of pieces of equipment through the thousands of miles of tunnels to the regeneration stations on a regular basis, perhaps once per shift, is impossible to achieve without unacceptable risks, schedule delays never envisioned by MSHA’s Estimator or MSHA’s economic or feasibility analysis, since they would render the mine not economically viable. Finally, it must be noted that even with these feasibility constraints, Stillwater tested an off board regeneration system and it failed as reported in the NIOSH Isozone Test at 12:

“The DCL BlueSky™ (DCL International, Concord, Ontario) system (Figure 3) is designed as an active system that does not completely regenerate during the duty cycle and therefore requires periodic removal of soot using integral electrical heaters and an off-board regeneration station to provide controlled heater power and compressed air for soot combustion.

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“The ambient concentrations of EC at downstream sampling locations were higher than 308 $\mu\text{g}/\text{m}^3$ in both cases when three test vehicles were equipped with DPF systems.”

NIOSH Case Study Report at 17.

Most importantly, the Phase 1 Report and the Partnership Phase 2 Case Study prove the dangers inherent in promulgating rules and mandating technology changes, before feasibility and safety is proven. As reported in the attached NIOSH Case Study Report, retrofit DPFs, the very technology that justified MSHA’s feasibility determination for rule, and appeared promising in the Isozone Phase 1 study, produced such high levels of NO₂ in actual mining conditions that the miners were withdrawn and the test stopped to prevent an imminent danger.

“Both tests #2 and # 3 were terminated, during the sampling period, due to high concentrations of NO₂ detected by the personal multi-gas monitor carried by the operator of the truck #92135. During test #2, while vehicles #92135 and #92535 were at the development section, the monitor showed NO₂ concentrations higher than 5 ppm, the 1973 ACGIH short term exposure level (STEL) for this gas adopted by MSHA (30 CFR 57.5001 1995). During test #3, when vehicle #92135 was at the orepass, the monitor carried by the operator showed concentrations in excess of 5 ppm. Elevated NO₂ exposures resulted in the removal of personnel from the work area. Exposures above 5 ppm were not reported during test #4; however, the peak concentrations of NO₂ measured at the downstream sampling station (Figure 10) indicate that personal exposures might have been relatively high in this case as well.”

During the regeneration process the vehicle needs to be parked next to the regeneration station that is connected to power and compressed air supplies. The system uses a silicon carbide wall-flow monolith filter element that allows relatively short 2-hour regenerations. The frequency and length of regeneration sessions is dependant on engine DPM emissions which depend upon engine design, condition, and nature of the duty cycle. This particular system was made available for this study by the Stillwater East Boulder mine. The system was decommissioned from the original application prior to this study because of the inability of operators to regenerate the DPF due to failed heating elements. The heating elements were replaced, and the system was installed on LHD #92506 (see Figure 3). Owing to the limited space available on the vehicle, this system was installed with a temporary arrangement and used only during the evaluation in the isolated zone and shop. The system was removed immediately after the tests, and it was not evaluated...” in the production because, in part, the mine was unable to provide the necessary infrastructure in production zones to support electrically regenerated systems.

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NIOSH Case Study Report at 19.

The NIOSH reports not only demonstrate the lack of feasibility of the 2006 160 TC PEL, they also demonstrate the need for adopting the proposed one-year, renewable extension process for mines that encounter feasibility problems meeting the 308 EC settlement standard, an amendment permitting the use of personal protective equipment and administrative controls, including rotation of personnel, pursuant with existing MSHA standards and policy.

“This critical work reinforces the urgent need to delete the 2006 160 TC PEL in this rulemaking. Without action now, the 160 PEL will become effective in 18 months and there is no feasible compliance method on the horizon. Under controlled “actual mining” conditions, with NIOSH, Stillwater and MSHA experts overseeing the Phase 2 Case Study tests using DPFs, downstream sampling results were all above 308 EC, and even equipment operator samples were in excess of the 160 PEL (Page 18, Phase 2 Report, March 26, 2004). Moreover, recent MSHA DPM sampling reported on the MSHA web site indicates that as of September 30, 2003, there were 167 underground metal/non metal mines in full production and MSHA had tested 155 of them for DPM levels. Of the tested mines, 51% were not in compliance with the 400 TC PEL and almost all of them will be out of compliance with the 160 TC PEL if it is retained and converted to an EC PEL.”

As we and others have noted in prior filings, Section 101(a)(6)(A) of the Mine Act provides that the Secretary in promulgating mandatory standards shall consider, among other things,

“the latest scientific data in the field, the feasibility of the standards, and the experience gained under this and other health and safety laws.”

The experience gained in the NIOSH Case Study production zone test at the Nye Mine is extremely relevant to this rulemaking and the Phase 1 Isozone Study. The March 26, 2004 Report provides information and comments on “latest scientific data” discussed in the Stillwater Phase 1 Report and throughout the rulemaking record. It reflects the experience gained under the MSH Act, led by the federal agency designated to conduct research for MSHA. It provides valuable information; particularly since there is no similar DPM rule or experience at OSHA or any other federal agency regarding diesel exhaust exposures in underground construction tunneling, trucking, rail, or other diesel exhaust exposure conditions. Together, the Phase 1 and Phase 2 Reports prove the need for immediate action by MSHA to conclude this rulemaking, including the deletion of the 2006 160 TC PEL.

The Chase Report

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Similar to the Stillwater Study, the report by Dr. Gerald Chase, "Characterization of Lung Cancer in Cohort Studies and a NIOSH Study on Health Effects of Diesel Exhaust in Miners", supports the deletion and revocation of the 160 microgram TC PEL. As commented on in the report, and to place it in perspective, we provide for the record the NIOSH data summaries upon which it is based (Attachment 2). We note that MSHA representatives were participants in the Federal Register announced public meeting, where the data was presented by NIOSH and NCI, and copies were made available to the public by both the agencies and Dr. Chase.

As the agency is aware, the mining industry has long maintained that MSHA's actions regulating DPM exposure should be guided by the results of the multi-year, multi-million dollar study being conducted by the National Cancer Institute and NIOSH. Regrettably, despite our repeated requests and Congressional directives that MSHA's rulemaking should be informed by the study, MSHA's previous Assistant Secretary chose not to await the results of this important study, even though it is recognized as the most informative scientific study of the effects of DPM exposure on the very population that the regulations seek to protect.

Since promulgation of the final DPM rule for underground metal/nonmetal mines, the first study results were made publicly available. Dr. Gerald Chase, in his analysis of the data, found that the:

"number and pattern of lung cancer deaths reported ... are in agreement with lung cancer deaths from the general population ... and less than what NIOSH appears to have predicted." (Emphasis added)

The ramifications of Dr. Chase's conclusion cannot, and should not, be ignored. The NIOSH/NCI study data proves the validity of the earlier comments submitted to the record that MSHA's PELs were not justified by the agency's faulty risk assessment, nor by any credible scientific evidence. Dr. Chase's conclusion supports the urgent need to delete the 2006 160 TC PEL.

MSHA's decision to promulgate the DPM standard was premised on two principal health concerns: (1) the transitory, reversible health effects of exposure to DPM and, (2) the long-term impacts that may result in an excess risk of lung cancer for exposed workers. Neither the 160 nor 400 TC standards adopted by MSHA's premature rule were based on scientific evidence supporting health effect risks at the PEL levels. No dose/response relationship related to the PELs could be demonstrated by MSHA, and EPA's review of diesel health effects science concluded that such a relationship is not supported by the scientific evidence. The study by NIOSH and NCI and the analysis conducted by Dr. Chase, confirm our earlier comments severely criticizing the scientific foundation upon which MSHA based the DPM rules. The NIOSH/NCI data and Dr. Chase's analysis and conclusion again proves the validity of the

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comments submitted by Dr. Jonathan Borak (Yale University Medical School) demonstrating that MSHA's health risk analysis underlying the PELs lacks any credible scientific basis.

A review of the record will reveal that the dire predictions of MSHA's flawed risk analysis, supposedly justifying the PELs, are contradicted by the NIOSH/NCI data from the study of 14,000 miners exposed to diesel exhaust over the last 45 years. The lack of excess risk shown to date by the NIOSH and NCI data is startling evidence rebutting MSHA's PELs and risk analysis. The lack of excess risk in the mining population is even more startling given that the exposures of the miners in the study were orders of magnitude higher than the PELs since they began working in the mines when the first diesel engines were introduced.

Of course, the Chase report and the NIOSH/NCI data is preliminary in nature and further data will be available over the next two years. But the Chase report and the NIOSH/NCI data support the conclusion of Dr. Borak and EPA, which alone mandate the deletion of the 160 TC PEL as: (1) not addressing a significant or demonstrated risk nor providing any identifiable benefits; (2) inconsistent with sound science, the latest scientific evidence, and actions of other agencies; and (3) inconsistent with sound science and data quality mandates.⁷

The NIOSH Respirator Report

The final item added to the record is a report prepared by Bureau of Labor Statistics and Centers for Disease Control and Prevention/NIOSH providing the results of a voluntary survey of respirator use and practices in private industry during the period August 2001 – January 2002. The report provides general information on respiratory protection use and practices across all industry, including mining. We are pleased that the report documents that many mining companies make respiratory equipment available to their employees based upon accepted standards regarding training, fit testing, etc. While the data may be informative, its voluntary basis, limited validation, and lack of detail render it of little use in any effort to change the existing respirator standards. However, the report does provide broad support for MSHA's proposal to permit the use of personal protective equipment for DPM exposures, in a manner consistent with existing regulations and policy.

This rulemaking proceeding does not state any specific, proposed rule changes to the current respirator standards, and it should not be extended to do so now. Such an extension

⁷ For the record, we note again the tainted origin of the 160 DPM standard resulting from the drafting role of a conflicted MSHA staff member who held dual roles at MSHA and the American Conference of Governmental Industrial Hygienists (ACGIH). There is ample proof in the record, including his sworn deposition, that he drafted the MSHA rule and the ACGIH equivalent Threshold Limit Value (TLV®), which was withdrawn following the revelation of the conflict and his unfortunate actions. MSHA should take the same action as ACGIH and withdraw the 160 PEL.



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would violate MSHA's rulemaking mandates, including its notice and comment duties, and render impossible the completion of this rulemaking to achieve compliance with the Interim Settlement. The respirator standards are complex and generic to all potentially harmful environments. Proposing changes to the respirator standards create multiple technical, scientific, medical and economic issues that must be closely examined from the perspective of MSHA's statutory mandates. OSHA respirator rulemaking proceedings demonstrate the vast number of issues that must be addressed in proposing to change the respirator standards and the impossibility of addressing such issues in this DPM rulemaking. It is simply inappropriate to consider respirator standard changes in an "expedited" rulemaking limited to the DPM standard.

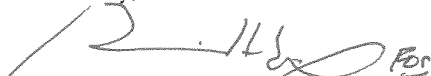
The Proposed Rule published on August 13, 2003, in accordance with the Interim Settlement, recognized the traditional and established role that personal protective devices can, and must play, as operators develop strategies to reduce miner's exposure to DPM. We are pleased that the limited voluntary survey, that predates the settlement and Proposed Rule, documents the role of PPE in protecting miners' health. We oppose, however, any change to the current respirator standards in this rulemaking.

Finally, we note the sad reduction of jobs and facilities in the metal/nonmetal underground mining industry in the United States since this rulemaking procedure began more than ten years ago. We are hopeful that MSHA will continue to work with industry and labor to achieve rational regulations that do not drive the remaining 167 operating underground mines to closure or prevent those few new mines on the horizon from opening.

In conclusion, we again urge expedited action by MSHA in finalizing this rulemaking consistent with the Interim Settlement Agreement, including: (1) the deletion of the January, 2006 160 TC DPM standard; (2) the permanent adoption of the 308 EC settlement standard; (3) adoption of the compliance extension provisions for the 308 EC standard to permit yearly applications and approvals based on feasibility issues; and (4) adoption of personal protective equipment and administrative control options, to supplement engineering controls, pursuant to existing standards and policy.

Thank you for the opportunity to provide these comments on behalf of the MARG Coalition.

Sincerely,


Henry Chajet, MARG Counsel

HC:snb

Patton Boggs LLP, Attorneys at Law

There were various attachments that accompanied Patton Boggs' comments on this rule. They have been put into one file that is 1,054 KB in size. The file is PDF. Use [this link](#) to access that file.