Comments Submitted by
Barrick Goldstrike Mines, Inc.

On Proposed Rule 30 C.F.R. Part 57
Diesel Particulate Matter Exposure of Underground Metal and Nonmetal Mines
70 Federal Register 53280 (Sept. 7, 2005)
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Submitted to the
Mine Safety and Health Administration
Office of Standards, Regulations, and Variances
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via email

Introduction

On September 7, 2005, the Mine Safety and Health Administration ("MSHA") published a proposed rule to revise the effective date of the existing diesel particulate matter ("DPM") final concentration limit at 30 C.F.R. § 57.5060(b). 70 Fed. Reg. 53280 (Sept. 7, 2005). MSHA also requested data and comments on certain issues that were identified in the preamble to the proposed rule.

These comments are submitted by Barrick Goldstrike Mines, Inc. ("Barrick). Barrick will provide comments on the proposed rule as well as responses to those specific inquiries where it has relevant information or experience. Barrick conducts underground gold mining operations in Nevada. Mr. Bill Ferdinand, Director, Environment, Health and Safety for Barrick's North American Region, testified at the agency hearing on the proposed rule on January 9, 2006 in Salt Lake City, Utah. Mr. Ferdinand's testimony is incorporated by reference into these comments. At the hearing, members of the hearing panel asked Mr. Ferdinand

questions related to his testimony concerning Barrick's experience with DPM management at its Nevada operations. Responses to those questions is also included in these written comments.

MSHA Should Not Adopt the 160 µg/m^3 TC Final Limit

First, and most importantly, Barrick urges that MSHA adopt the current interim personal exposure limit of 308 µg/m^3 EC as a final standard and defer any further reductions in the regulatory PEL pending completion of ongoing research to develop an adequate scientific basis for further reductions and to determine whether such reductions are technologically and economically feasible. The administrative record compiled to date does not include sufficient evidence to support reductions below the current interim limit. Furthermore, based on the data in the record and Barrick's underground mining experience, it is evident that the proposed final limit of 160 µg/m^3 TC is not technologically or economically feasible within the time frame of the proposed rule. Barrick understands that MSHA intends to revise the 160 µg/m^3 TC limit at some point by applying a conversion factor and expressing the standard as an EC limit. That does not change our conclusion. The 160 µg/m^3 limit, whether expressed as total carbon or elemental carbon, lacks sufficient scientific support and is not technologically or economically achievable. While Barrick is submitting comments on many of the issues raised in September 7, 2005 rulemaking, all of those comments should be considered in this context: MSHA should not adopt any rule which reduces the PEL below the current level.

It is unclear to Barrick why MSHA is proceeding with the proposed rule—and the 160 µg/m^3 TC proposed final standard—in the face of substantial evidence that further reductions are unwarranted and unachievable. MSHA's own statements call the final standard into question. When the new interim standard was implemented on June 6, 2005, the agency acknowledged that

"the current DPM rulemaking record lacks sufficient feasibility documentation to justify lowering the DPM limit below 308 $\mu g/m^3$ EC." 70 Fed. Reg. at 32, 916. In that same rulemaking MSHA admitted that "evidence in the current DPM rulemaking is inadequate for [the agency] to make determinations regarding revision to the final DPM limit." 70 Fed. Reg. 32,870. MSHA also acknowledged when it adopted the current interim limit, that "it would be infeasible at this time for the underground [metal/nonmetal] mining industry to reach a lower interim limit." 70 Fed. Reg. at 32,944. Yet the proposed rule would force mine operators to lower interim limits—acknowledged as infeasible—as early as January, 2007. The agency's determination to proceed with the proposed phase in toward the discredited final standard, rather than initiate a rulemaking to remove it, is inexplicable. On this issue, Barrick incorporates comments submitted by the National Mining Association and the MARG Coalition by reference.

Response to Inquiries in the Federal Register Notice

1. Whether the Assumptions Supporting the 2001 Cost Estimates Remain Valid.

The assumptions supporting the 2001 cost estimates should be revisited by MSHA. Assumptions regarding replacement of underground diesel engines with EPA approved Tier 1 and Tier 2 engines were too optimistic. At Barrick's Goldstrike operations, underground equipment is distinguished between production equipment—LHD, loaders and haulers, scoops, jammers, bolters, jumbos and haul trucks—and utility equipment—forklifts, tractors, bobcats, dozers, etc. At Goldstrike, since 2001, approximately 28 engine change outs have occurred and another 20 pieces of mine equipment have been purchased, all with tier rated engines. These numbers relate to a total mine engine inventory of 114 units. While we believe that replacement

of older engines holds promise for reducing diesel particulate emissions, it will not occur quickly enough to achieve the reductions on the schedule contained in the proposed rule.

At the hearing in Salt Lake City, panel members requested additional information related to the total horsepower in the two equipment categories and the increased costs related to retrofitting for the latest Tier level engines. Based on our most current data, 73% of the total horsepower is production equipment, and 27% of the total horsepower is utility equipment. We also gathered data to determine the relative time of use of the two categories of equipment. In the last year, using dispatch data as well as hourly meter reading data, the operations experienced approximately 179,636 hours of production equipment use and 77,675 hours of utility equipment use. Some of this information is estimated, since some dispatch data records only "equipment use" time. Breaking these numbers down by group and per standard eleven hour production shift results in an estimate of 246 engine hours per shift of production equipment and 106 engine hours per shift in the utility class. These calculations confirm our decision to focus on engine replacement and rebuilds in the more heavily used production equipment categories. These changes to date, together with the ventilation improvements described below, have allowed Goldstrike operations to meet the interim DPM limit. It is clear to us that replacing or rebuilding the remaining engines to meet Tier 1 and Tier 2 standards, even if that was done on a more accelerated basis, would not make significant progress toward the proposed 160 $\mu g/m^3$ TC final limit.

MSHA's assumptions should also be revised to incorporate rapid and unexpected increases in the cost of diesel fuel, which will dramatically affect the cost of compliance with the 160 $\mu g/m^3$ TC standard. In 2001, when the proposed limit was adopted, diesel costs were approximately $1.40 per gallon. Currently, diesel prices are in the range of $2.39 per gallon, an

increase of over 70%. Available control technologies, particularly filters, reduce horsepower and increase fuel consumption and costs to accomplish the same work. The agency's cost estimates should acknowledge current diesel fuel prices. Under these higher prices, control technologies that increase fuel consumption are likely to render ore reserves uneconomic and may shorten mine life.

2. Economic and Technological Feasibility

MSHA has requested comments on whether it is technologically or economically feasible for operators to meet the 160 $\mu g/m^3$ TC standard within the proposed five-year phase in period. Experience at Goldstrike since 2001 demonstrates to us that it is not.

Our efforts to significantly reduce the diesel particulates in the underground work environment have met with limited success using new technology coupled with enhancing present control technology. Barrick has tested regenerative filters, increased the number of engines meeting EPA Tier I and II requirements, significantly increased ventilation and implemented new high maintenance standards. Taken together, these efforts have allowed us to meet the interim standard. We have reduced diesel particulates that were commonly in the range of 600 to 800 $\mu g/m^3$ (TC) in 2001 to levels today that typically range from 250 to 450 $\mu g/m^3$ (TC).

To meet the interim standard, we have increased ventilation from 800,000 cfm in 2002 to over 1,000,000 cfm by 2004, and again to nearly 1.5 million this year, effectively doubling the air volume moving through the mine. During this same period, we have significantly increased maintenance programs and have replaced some engines with EPA Tier I and Tier II engines. We have also modified mine designs to minimize DPM concentrations and we have installed a number of environmental cabs. Our estimate of the total cost of measures taken to achieve

compliance with the current interim standard is approximately $1.68 million annually ($8.4 million since 2001). Our experience indicates that MSHA's 2001 cost estimates dramatically understated the costs of compliance.

At the hearing in Salt Lake City, the hearing panel requested a breakdown of the $8.4 million in compliance expenditures. The key elements of these expenditures include:

- Engine repowers - 8 at approximately $15,000 each - for a total of $120,000
- Cab installed on KMS 608 at rebuild - $43,000
- Two new Tamrock 007 loaders with cabs at additional cost of $43,000 each - $86,000
- Three new Tamrock 1400 loaders with cabs at an additional cost of $48,000 - $144,000
- Ventilation improvements:
    - 1225 South Meikle Spray Chamber (clean and cool 300,000 cfm airflow for South Meikle) - $139,000
    - Rodeo Betze portal drift from the Betze pit to the 4100 level at Rodeo - $1,200,000
    - 2005 Rodeo Betze Portal Drift Ventilation Intake (to improve ventilation to lower Rodeo) - $1,300,000 (approximate expenditure to date for the spray chamber only)
    - Using large auxiliary fans (48" to 54" diameter) to increase air flow in headings since 2003 - $750,000
    - Increased electrical power consumption to increase ventilation from 1,700,000 cfm in 2002 to 2,300,000 cfm in 2005 – approximately

$560,000 per year (based on estimated 878 kW additional power consumption for surface fans).

Expenditures to date have reduced DPM concentrations to meet the interim standard in most parts of the mine. Further reductions will be more difficult and expensive. Ventilation is near its capacity. Further increases are likely to create fugitive dust problems from haulage vehicles. Replacement of the remaining mine and utility equipment with Tier I and Tier II engines would not achieve the 160 $\mu g/m^3$ TC standard. Barrick has not identified filters that would be effective at our site and our review of the literature and the experience of other mines with filters has not indicated a suitable filter technology. As a result, at this time, Barrick is unable to prepare a cost estimate for compliance with the 160 $\mu g/m^3$ TC standard, because we cannot reasonably describe control technologies or methodologies that would be effective for our operations. Circumstances at Barrick's operations are similar to most other gold mining operations. Sampling data available to MSHA and NIOSH indicate that the vast majority of operators cannot achieve the 160 $\mu g/m^3$ TC limit.

If the reductions in the standards are implemented as described in the proposed rule, the only effective means of insuring compliance will be to put almost every underground worker in a respirator. Barrick estimates that in the early years of the phased reduction in the proposed rule, approximately 56% of our underground workers will require respirators. To meet the 160 $\mu g/m^3$ TC standard will require respirators on approximately 70% of our underground workers. MSHA has not evaluated the potential impacts—on workers or on operators—of a regulatory strategy that will force workers to wear respirators for most of an eleven hour shift. Because there is no clear scientific basis for the final standard, MSHA will be asking workers to bear this burden without any appreciable health benefit in return.

3. Experience with Diesel Particulate Filters

Barrick has limited experience with diesel particulate filters at its Goldstrike Operations. One active regenerative DPF system, specifically DCL Mine-X Black Out Soot filter, was tested on a Tamrock 1400, 8 yard^3 scoop over an 8 month period. Because of filter limitations, the scoop was only operational for 7 to 8 hours per shift before the backpressure increases caused the need for filter regeneration. This rendered the equipment unusable for the remainder of our normal 11 hour production shift. The active regeneration system was determined to be impractical because it was not effective for an entire shift and could not be regenerated between shifts (regeneration typically took between 2 and 5 hours).

Barrick's specific experience with DPF technology is consistent with what we have heard from other mining companies and with the MSHA's conclusion that "selection and implementation [of DPF systems has] not proceeded as quickly as anticipated since promulgation of the 2001 final rule . . ." 70 Fed. Reg. at 53,283. At this time, performance of diesel filter technology in the field has been, at best, disappointing. It would be inappropriate for MSHA to force operators to rely on unproven and unreliable technology to achieve the final DPM standard.

4. Experience with Environmental Cabs

Barrick has installed six loaders with environmental cabs to decrease exposure to diesel particulate matters and achieve other work environment considerations such as dust and noise reductions. By the end of 2011, approximately 65% of the mine and support equipment will have been fitted with environmental cabs—approximately 100 units. Environmental cabs are effective in reducing exposure to diesel particular emissions, but only for the operators in those cabs. Environmental cabs do not provide an effective strategy for meeting the proposed final standard throughout the workplace. In addition, environmental cabs are tremendously expensive.

It is estimated that the replacement of this equipment along with environmental cabs will cost nearly $49 million (in 2005 dollars). Barrick is investing in the environmental cabs because they provide us with additional benefits beyond protection from diesel particulates. They are not a cost effective means of meeting the standards in the proposed rule.

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

MSHA seeks specific comments on whether the proposed five-year phase in period complies with Section 101(a)(9) of the Mine Act. 70 Fed. Reg. at 53,288. Barrick's response is that the five-year phase in period, a longer phase-in period, or a decision to adopt the current interim limit of 308 $\mu g/m^3$ EC as a final standard would all comply with Section 101(a)(9) of the Mine Act and that MSHA should take no action to require reductions below the current interim standard.

Any phase in or decision to defer further reductions in the standard will comply with Section 101(a)(9) of the Mine Act, because, as MSHA has explained, it "will not reduce miner protection." 70 Fed. Reg. at 53,288. Section 101(a)(9) of the Mine Act provides that "[n]o mandatory health or safety standard promulgated under this subchapter shall reduce the protection afforded miners by an existing mandatory health or safety standard." 30 U.S.C. § 811(a)(9). MSHA has used a "net effects" approach in applying this rule. *See, e.g.*, *Int'l Union, UMWA v. MSHA*, 407 F.3d 1250, 1256–58 (D.C. Cir. 2005). Under this approach, the agency compares all of the health or safety benefits resulting from a new standard to all of the health or safety benefits of an existing standard. *Id.*

The proposal to adopt the current 308 $\mu g/m^3$ EC limit as a permanent standard satisfies this test. Indeed, MSHA has already concluded that "it is questionable whether the final concentration limit of 160_{TC} $\mu g/m^3$ would provide any more protection than the 308_{EC} $\mu g/m^3$"

limit. 70 Fed. Reg. at 53288. This conclusion is based in part on the recognized implementation problems associated with the 160 $\mu g/m^3$ limit. For example, MSHA recognized that there currently is not a "practical sampling strategy that would adequately remove organic carbon interferences that occur when TC is used as the surrogate." *Id.* The administrative record developed over the last five years thus demonstrates that the 160_{TC} $\mu g/m^3$ limit is not currently enforceable. MSHA's inability to enforce a final limit of 160_{TC} $\mu g/m^3$ is critical because Section 101(a)(9)—which seeks to preserve the protection afforded miners under current safety and health standards—is predicated on the assumption that the existing standards are enforceable and therefore ensure the health of miners. MSHA's decision to phase-in or replace an unenforceable limit is not only reasonable, it is necessary.

Moreover, the problems with economic and technological feasibility identified elsewhere in these comments and throughout the administrative record demonstrate that many mines, including Barrick's Goldstrike operations, will not be able to comply with a limit of 160 $\mu g/m^3$ TC. This means that most miners at these sites will be required to wear respirators for extended periods of time. MSHA and the miners themselves have implicitly recognized that the prolonged use of respirators by miners may have adverse health consequences and are therefore not a long-term solution.

6. Conversion from Total Carbon to Elemental Carbon

MSHA has already acknowledged that total carbon is not an effective surrogate for measuring diesel particulate matter and that the standard must be expressed as an elemental carbon standard. *See* 70 Fed. Reg. at 32,871. Barrick agrees that the final standard should be expressed as an elemental carbon standard, but at this time, Barrick does not have any data

relevant to the appropriate conversion factor and recommends that the question of the final conversion factor be deferred together with the final standard.

7. The Proposed Five-Year Phase-In

Barrick is pleased that MSHA has acknowledged that it will take additional time to achieve any further reductions in diesel particulate matter concentrations below the current interim standard. However, it is our view that the five year phase in, with arbitrary annual 50 microgram reductions, is not practical. Because there is no technology available to meet the final limit, Barrick and other operators will be forced to design and implement a new plan every year to meet the lowering interim levels and maintain compliance with regulatory standards. Focusing on annual short-term reductions is not an efficient or effective use of either MSHA's or the operator's resources. The annual reductions will also increase the time and effort devoted to preparing, submitting, reviewing and approving extensions.

As noted in the first section of these comments, Barrick believes that MSHA should adopt the current interim standard as the final standard and delay further reductions until ongoing studies are completed and it is determined whether there is adequate scientific support for a different standard. However, if the agency ultimately determines to go forward with lower standards, MSHA should reevaluate information regarding technological and economic feasibility and reduce the number of phases and extend the time frame for compliance with the final standard. Barrick recommends that the reductions should be scheduled in two phases over an eight year time frame, establishing a lowered interim standard after the first four years and requiring compliance with the final standard at the end of eight years. During the initial four years, the standard would remain at the 308 $\mu g/m^3$ EC level. At the end of four years, the

exposure level would be reduced to the EC equivalent of 235 $\mu g/m^3$. Then, at the end of the second four year step phase, the 160 $\mu g/m^3$ limit would be implemented.

This type of two phase approach allows for future technology enhancements to be developed and implemented. The scheduled reductions would drive technology development but would allow time for R & D and in-field testing—time that is not allowed by the phased one-year reductions in the proposed rule. This two phase approach also acknowledges that underground mine conditions are dynamic, rather than static, allowing time for operators to plan and implement changes in mining techniques and strategies to improve performance and achieve reductions toward the two step reductions. Again, such improvements are not typically accomplished on an annual basis, but require a longer period of time for planning, design, testing and implementation. Finally, the two phase process described here provides for continued protection of underground miners while allowing operators time to meet a proposed standard that is effectively being driven by technological developments.

8. Medical Evaluation and Testing and Transfer

MSHA seeks comments on whether the final rule should include 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. Barrick already complies with this proposed requirement. Each of our employees undergoes a medical evaluation before being fitted with a respirator. At the hearing in Salt Lake City, the hearing panel asked Barrick to provide cost information for our medical evaluations. Based on currently available data, we estimate that the average cost per person for medical evaluations for our Goldstrike operations is $660.

MSHA also seeks comments on whether the final rule should include a provision establishing transfer rights for workers who are unable to wear a respirator. The proposed rule includes specific language which would require that such a worker "must be transferred to work in an existing position in an area of the same mine where respiratory protection is not required" and that such worker "must continue to receive compensation at no less than the regular rate of pay in the classification held by that miner" prior to transfer. 70 Fed. Reg. at 53,289. These provisions should not be included in the final rule. As explained in our comments above, under the proposed rule, most of our underground workers will be required to wear respirators. The availability of alternative positions will be extremely limited. Moreover, wage scales for underground workers are typically higher than for comparable aboveground positions in our operations. If any transfer language is included in the final rule, transfer rights should be limited to those circumstances where (1) a position is available where respiratory protection is not required, and (2) the worker is qualified for that available position. The rate of pay should not be tied to the position held by the worker prior to the transfer but should be based on the new position.

9. Extensions Pursuant to § 57.5060(c)

The proposed rule recognizes that many operators will be unable to comply with the proposed incremental reductions and/or the final standard and therefore, MSHA has requested comments on the provisions for granting extensions with the exposure limits that are greater than the final limit. 70 Fed. Reg. at 53,289. The current rule, 43 C.F.R. § 57.5060(c) provides for one year extensions under certain circumstances. Barrick agrees with MSHA's conclusion—discussed in the September 7, 2005 proposed rulemaking, that it is unnecessary to limit the application of extensions to mines operating diesel equipment prior to October 29, 1998. *See* 70

Fed. Reg. at 53,289. MSHA should delete that provision, 43 C.F.R. § 57.5060(c)(3)(i) from the existing regulations.

Further changes in the extension provisions are also necessary. If MSHA proceeds with the phased in reductions in the proposed rule, the extension provisions are critical for operators, like Barrick, to maintain compliance. As we have explained, Barrick is not capable of meeting the standards and time frames in the proposed rule and, if it is adopted, will be seeking an extension under the regulations. The current provisions, which provide only one year extensions, are impractical. Operators will spend most of their time preparing extension applications and supporting documentation and MSHA will spend most of its time reviewing those applications. The extension process will become a continuous cycle, diverting time and resources away from achieving the long term DPM standards. Barrick recommends that the regulations provide for longer extensions to reduce the burden on operators and the agency.

The extension process also needs to be more formalized, efficient and transparent. Barrick agrees with other operators that the extension provision should be revised to contain: (a) a description of materials that must be provided in support of a request for extension; (b) a description of the contents of a request for extension; (c) clear criteria for granting an extension; (d) a specified and abbreviated timeframe for rendering a decision; (e) the requirement that a denial of a request for extension contain a written explanation of the reasons compliance was determined to be technologically and economically feasible; (f) procedures for an appeal to the Administrator for a denial of a request for extension or for a failure to act on a request; and (g) an expedited procedure for further appeal to the Review Commission.

The regulations should more clearly specify the criteria for determining whether compliance is economically and technologically feasible. Extensions should be granted unless

there is substantial and credible evidence that there is an available technology or engineering control that (1) can be implemented at the mine, and (2) will actually reduce worker exposure to DPM. Extensions should also be granted in those cases where compliance costs are out of proportion to the expected benefits. Operators should not bear the burden of showing that every technology or engineering control is not applicable to their particular property. If technologies or engineering controls have been tested within the industry and found to be infeasible at similar mines, that evidence should be sufficient to support an application for an extension.

If a request for an extension is denied, the agency should issue a written decision setting forth the specific reasons for the denial, including an explanation of how the District Manager believes that compliance with the standard was technologically and economically feasible. The time for acting on extension applications should be limited by regulation: the District Manager should be required to issue a final determination within 60 days. The mine operator should have the right to appeal the denial of a request for extension to the Administrator and the Administrator should be required to issue a determination within 30 days. The final rule should include a clear mechanism of appeal from an adverse determination of the Administrator to the Review Commission.

Conclusion

MSHA should adopt the current interim standard as a final standard until and unless there is sufficient scientific evidence to support a lower standard and sufficient evidence for the agency to conclude that a lower standard can be economically and technologically achieved by the metal/nonmetal mining industry.