FINAL REGULATORY ECONOMIC ANALYSIS

AND

FINAL REGULATORY FLEXIBILITY ANALYSIS

Final Rule: 30 CFR Part 62

RIN 1219-AA53

Health Standards for Occupational Noise Exposure

at Metal, Nonmetal, and Coal Mines

Office of Standards, Regulations, and Variances

Mine Safety and Health Administration

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I. EXECUTIVE SUMMARY

A. INTRODUCTION

The Mine Safety and Health Administration (MSHA) is revising its existing health standards for occupational exposure to noise at metal/nonmetal, and coal mines. Section 101 of the Federal Mine Safety and Health Act of 1977 provides the authority for this rulemaking. The final rule provides increased health protection for miners by clarifying compliance requirements, adding new requirements to address identified hazards, eliminating outdated and unnecessary standards, introducing more performance-oriented requirements, upgrading existing provisions consistent with advances in technology, and providing alternative methods of compliance where possible.

Executive Order (E.O.) 12866 requires that regulatory agencies complete a Regulatory Economic Analysis (REA) to assess both the costs and benefits of intended regulations. MSHA has fulfilled this requirement and determined that the final rule will not result in major cost increases nor have an effect of $100 million or more on the economy.

B. BENEFITS

The benefits from the final rule include the reduction in the numbers of cases of noise induced hearing loss (NIHL) and

hearing impairment. MSHA anticipates that implementation of the provisions in the final rule will reduce the number of cases of noise-induced hearing impairment by about 64.4%. Full compliance with the final rule is also expected to prevent or contribute to the prevention of 23,809 cases of hearing impairment over 40 years (approximately 595 cases of hearing impairment per year). In addition, MSHA expects reductions in the number of worker's compensation claims for hearing loss, productivity losses, workplace injuries, absenteeism, and physiological and psychological problems that are associated with NIHL.

C. COMPLIANCE COSTS

MSHA estimates that the total cost of the final rule will be approximately $8.9 million annually, of which about $8.75 million will be borne by mine operators. The annualized cost of the final rule is based on total first year costs (both one-time and annual costs) of $38.4 million and costs of $4.1 million each year thereafter. The annual cost of the final rule will be approximately $7.38 million for the metal/nonmetal mining industry and approximately $1.37 million for the coal mining industry. The cost of the final rule includes savings arising from the elimination of certain existing coal mining requirements, which MSHA estimates currently cost the coal mining industry approximately $5.1 million annually. The elimination of

these costs will partially offset the new costs for the coal mining industry of approximately $6.5 million resulting from the final rule.

MSHA has determined that compliance by the mining industry with the requirements of the final rule is both technologically and economically feasible.

D. REGULATORY FLEXIBILITY ACT

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

MSHA has determined that this final rule will not impose a substantial cost increase on small mines, whether a small mine is defined as one with 500 or fewer miners or one with fewer than 20

miners. Using the Agency's traditional definition of a small mine, which is one employing fewer than 20 miners, the estimated cost of the final rule on small coal mines will be about $0.6 million annually, as compared to estimated annual revenues of about $767 million; the estimated cost of the final rule on small metal/nonmetal mines will be about $4.3 million annually, as compared to estimated annual revenues of about $10,651 million. Using the SBA definition of a small mine, as one with 500 employees or fewer, the estimated cost of the final rule on small coal mines will be approximately $1.3 million annually, as compared to estimated revenues of $19,039 million annually; the estimated cost of the final rule on small metal/nonmetal mines will be about $6.9 million, as compared to annual revenues of about $32,810 million.

Based on its analysis, MSHA has determined that the final rule will not have a significant economic impact on a substantial number of small mines. MSHA has so certified these findings to the SBA. The factual basis for this certification is discussed in Part V of this document and will be included in the preamble to the final rule for publication in the Federal Register.

II. INDUSTRY PROFILE

A. SUMMARY

1. Introduction

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

2. Structure of the Mining Industry

MSHA divides the mining industry into two major segments based on commodity: the coal mining industry and the metal/nonmetal (M/NM) mining industry. These major industry segments are further divided based on type of operation (i.e., underground mines, surface mines, independent mills, plants, shops, and yards). MSHA maintains its own data on mine type, size, and employment. MSHA also collects data on the number of independent contractors and contractor workers by major industry segment.

MSHA categorizes mines according to size on the basis of the number of employees. For the purpose of this final Regulatory Economic Analysis (REA), MSHA defines small mines to be those having fewer than 20 employees and large mines to be those having

20 or more employees. Over the past 20 years, for rulemaking purposes, MSHA has consistently used this small mine definition. MSHA has used this criterion to define small mines because mines of this size are generally recognized in the industry as having operational characteristics (including production methods and compliance costs) that are often different from those of larger mines. However, for the purposes of the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA has evaluated the impact of the final rule on small entities, as defined by SBA. For the mining industry, these are mines with 500 or fewer employees.

Table II-1 presents the number of small and large mines and the corresponding number of miners, excluding contractors, by major industry segment and mine type. MSHA does not maintain a data base which would allow determination of the types of services provided by independent contractors or the job titles of contractor employees. Table II-2, however, presents MSHA data on the number of independent contractors and the corresponding number of employees by major industry segment and the size of the operation based on employment.

TABLE II-1: Distribution of Operations and Employment (excluding contractors) by Mine Type, Commodity, and Size

MINE TYPE	SMALL (<20 EMPLOYEES)		LARGE (≥20 EMPLOYEES)		TOTAL	
	# Mines	# Workers	# Mines	# Workers	# Mines	# Workers
COAL						
Underground	417	4,178	543	44,784	960	48,962
Surface	722	4,141	388	28,774	1,110	32,915
Shop/Yard/Mill/Plant	372	2,490	119	4,646	491	7,136
Office workers		752		5,030		5,782
Coal Subtotal	**1,511**	**11,561**	**1,050**	**83,234**	**2,561**	**94,795**
METAL/NONMETAL						
Underground	131	1,123	130	16,590	261	17,713
Surface	8,965	50,015	1,219	80,979	10,184	130,994
Shop/Yard/Mill/Plant	288	2,181	222	18,852	510	21,033
Office workers		8,530		18,644		27,174
M/NM Subtotal	**9,384**	**61,849**	**1,571**	**135,065**	**10,955**	**196,914**
TOTAL ALL MINES	**10,895**	**73,410**	**2,621**	**218,299**	**13,516**	**291,709**

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on preliminary 1997 MIS data (quarter 1 - quarter 4, 1997). MSHA estimates assume that office workers are distributed between large and small operations the same as non-office workers.

TABLE II-2: Distribution of Contractors and Contractor Employees by Major Industry Segment and Size of Operation

CONTRACTORS	SMALL (<20 EMPLOYEES)		LARGE (≥20 EMPLOYEES)		TOTAL	
	# Contr	# Workers	# Contr	# Workers	# Contr	# Workers
COAL						
Nonoffice workers	3,561	14,151	333	15,753	3,894	29,904
Office workers		1,291		1,160		2,451
Coal Subtotal	**3,561**	**15,442**	**333**	**16,913**	**3,894**	**32,355**
METAL/NONMETAL (M/NM)						
Nonoffice workers	2,855	14,161	381	23,829	3,236	37,990
Office workers		734		1,191		1,925
M/NM Subtotal	**2,855**	**14,895**	**381**	**25,020**	**3,236**	**39,915**
TOTAL CONTRACTORS	**6,416**	**30,337**	**714**	**41,933**	**7,130**	**72,270**

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on preliminary 1997 MIS data (quarter 1 - quarter 4, 1997). MSHA estimates assume that office workers are distributed between large and small contractors the same as non-office workers.

3. Economic Characteristics

The U.S. mining industry's 1997 production was estimated at about $59.5 billion. Coal mining contributed about $20 billion to the Gross Domestic Product in 1997 while metal/nonmetal mining contributed about $39.5 billion.[1] An estimated $17 billion is reclaimed annually from recycled metal and mineral materials such as scrap iron, aluminum, and glass.[2]

B. STRUCTURE OF THE COAL MINING INDUSTRY

MSHA divides the U.S. coal mining industry into two major commodity groups, bituminous and anthracite. The bituminous group includes the mining of subbituminous coal and lignite. Bituminous mining operations represent over 99% of U.S. coal production.[3] About 60% of these are large (having 20 or more employees) whereas nearly all anthracite mine operations are small (having fewer than 20 employees).

Underground bituminous mines are more mechanized than anthracite mines because most underground anthracite mines still hand-load. Over 70% of the underground bituminous mines use continuous mining and longwall mining methods. The remaining use drills, cutters, and scoops. Although underground coal mines generally use electrical equipment, a growing number of these mines use diesel-powered haulage equipment.

Surface mining for coal involves drilling, blasting, and hauling and are similar for all coal commodity types. Most surface mines use front-end loaders, bulldozers, shovels, or trucks for haulage; a few still use rail haulage. Although some coal may be crushed to facilitate cleaning or mixing, coal processing usually involves cleaning, sizing, and grading.

C. STRUCTURE OF THE METAL/NONMETAL MINING INDUSTRY

The metal/nonmetal mining industry consists of about 70 different commodities including metals, industrial minerals, stone, and sand and gravel. Table II-3 presents the number of metal/nonmetal mines and miners by major commodity category and mine size.

TABLE II-3: Estimated Distribution of Metal/Nonmetal Mines and Miners*

Commodity	SMALL (<20 EMPLOYEES)		LARGE (>20 EMPLOYEES)		TOTAL	
	# Mines	# Miners	# Mines	# Miners	# Mines	# Miners
Metal	178	1,046	196	40,375	374	41,421
Nonmetal	554	3,051	234	22,178	788	25,229
Stone	2,672	20,081	907	46,359	3,579	66,440
Sand & Gravel	5,980	29,141	234	7,509	6,214	36,650
TOTAL	9,384	53,319	1,571	116,421	10,955	169,740

* Excludes office workers and contractors.

1. Metal Mining

Metal mining operations represent about 3% of the metal/nonmetal mines, employ about 24% of the metal/nonmetal miners, and account for about 32% of the value of metal/nonmetal minerals produced in the U.S.[4] About 48% of the metal mining operations are small (employing fewer than 20 employees).

Underground metal mining uses a few basic mining methods, such as stoping, room and pillar, and block caving, with primary noise sources being diesel-powered haulage equipment, pneumatic drills, and mills. Larger underground metal mines use more hydraulic drills and track-mounted haulage whereas smaller underground metal mines use more hand-held pneumatic drills. Stope mining uses more hand-held equipment.

Surface metal mines include some of the largest mines in the world. Surface mining operations (drill, blast, haul) use the largest equipment and are similar for all commodity types.

2. Nonmetal Mining

Nonmetal mining operations (excluding stone and sand and gravel mining) represent about 7% of the metal/nonmetal mines, employ about 15% of the metal/nonmetal miners, and account for about 36% of the value of metal/nonmetal minerals produced in the U.S.[5] About 70% of the nonmetal mining operations are small (employing fewer than 20 employees).

Nonmetal mining uses a wide variety of underground mining methods. For example, potash mines use continuous miners similar to those used for coal mining; oil shale uses in-situ retorting; and gilsonite uses hand-held pneumatic chippers. Some nonmetal operations use kilns and dryers in ore processing. Ore crushing and milling are processes common to both nonmetal and metal mining. Underground nonmetal mining operations generally use more block caving, room and pillar, and retreat mining methods; less hand-held equipment; and more electrical equipment than metal mining operations. As with underground mining, surface mining methods vary more than for other commodity groups. In addition to drilling and blasting, other surface mining methods such as evaporation and dredging are also utilized, depending on the ore characteristics.

3. Stone Mining

There are eight different stone commodities, of which seven are further classified as either dimension stone or crushed and broken stone. Stone mining operations represent about 33% of all metal/nonmetal mines, employ about 39% of all metal/nonmetal miners, and account for about 20% of the value of metal/nonmetal minerals produced in the U.S.[6] About 75% of the stone mining operations are small (having fewer than 20 employees).

Stone mining in the U.S. is predominantly done by quarrying with few variations. Diesel powered haulage is used to transfer the ore from the quarry to the mill. Crushed stone mines typically drill and blast whereas dimension stone mines use channel burners, drills, or wire saws. Crushed stone milling includes crushing and sizing.

4. Sand and Gravel Mining

Based on the number of mines, sand and gravel mining represents the single largest commodity group in the U.S. mining industry. About 57% of all metal/nonmetal mines are sand and gravel operations. They employ about 22% of all metal/nonmetal miners and account for about 12% of the value of metal/nonmetal minerals produced in the U.S.[7] Over 96% of the sand and gravel operations are small.

Construction sand and gravel is generally exploited from shallow deposits using dredges or draglines and only washing and screening milling methods. As in other surface mining operations, sand and gravel operations use diesel powered haulage equipment, such as front-end loaders, trucks, and bulldozers. In addition, the preparation of industrial sand and silica flour operations involves the use of crushers, ball mills, vibrating screens, and classifiers.

D. ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

The U.S. coal industry produced a record 1.088 billion tons of coal in 1997 with an estimated value of approximately $20 billion. Electric utilities were the largest consumer, followed by other industrial uses, coke plants, and residential/commercial users. Industrial applications include the use of coal products in the manufacturing of other products, such as plastics, dyes, drugs, explosives, solvents, refrigerants, and fertilizers.[8]

Of the several different types of coal, bituminous and subbituminous account for 996 million short tons of coal production. The remainder of U.S. coal production is lignite (87 million tons) and anthracite (5 million tons).[9] Although anthracite offers superior burning qualities, it represents only a small and diminishing share of total coal production.

Mines east of the Mississippi account for about 53% of 1997 U.S. coal production. For the period 1949 through 1995, coal production east of the Mississippi River fluctuated relatively little, from a low of 395 million tons in 1954 to a high of 630 million tons in 1990. It was 577 million tons in 1997. During this same period, however, coal production west of the Mississippi increased each year from a low of 20 million tons in 1959 to a record 511 million tons in 1997.[10] The growth in western coal is due, in part, to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in

the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

Preliminary MSHA data for 1997 indicate that small mines produced about 3.9% of the total coal production (about 42.3 million tons) and large mines produced about 96.1% of the total (1,045.5 million tons).[11] In 1997 coal exports were estimated at about 84 million short tons and imports were estimated at about 7 million short tons.[12] The 1997 estimate of the average value of coal at the point of production was about $18.11 per ton for bituminous coal and lignite, and $34 per ton for anthracite.[13]

The U.S. coal industry enjoys a fairly constant domestic demand because of the use of coal by electric utilities. MSHA does not expect a substantial change in coal demand by utilities in the near future because of the high conversion costs of changing a fuel source. Other experts in energy predict that coal will continue to be the dominant fuel source of choice for power plants built in the future. Nuclear and hydro power currently comprise, and are anticipated in the future to comprise, only a small fraction of energy sources for utilities.

E. ECONOMIC CHARACTERISTICS OF THE METAL/NONMETAL MINING INDUSTRY

1. Summary

The 1997 value of all metal/nonmetal mining output was approximately $39.5 billion.[14] Metal mining contributes $12.4

billion to this total and includes metals such as aluminum, copper, gold, and iron. Nonmetal output is valued at $14.4 billion and includes commodities such as cement, clay, and salt. Stone mining contributes about $7.9 billion, and sand and gravel contributes about $4.8 billion.

The entire metal/nonmetal mining industry is markedly diverse not only in terms of variety, but also in terms of each commodity's usage. For example, metals such as iron and aluminum are used to produce vehicles and other heavy duty equipment as well as consumer goods such as household equipment and soda pop cans. Other metals, such as uranium and titanium, have limited uses. Nonmetals like cement are used in construction while salt is used as a food additive and on roads in the winter. Soda ash, phosphate rock, and potash have a wide variety of commercial uses. Stone and sand and gravel are used in numerous industries including the construction of roads and buildings.

A detailed economic picture of the metal/nonmetal mining industry is difficult to develop because most mines are either privately-held corporations or sole proprietorships, or subsidiaries of publicly-owned companies. Privately-held corporations and sole proprietorships typically do not make their financial data available to the public and are not required by the Securities and Exchange Commission to provide public information. Further, parent companies are not required to

separate financial data for subsidiaries in their reports to the Securities and Exchange Commission. As a result, financial data are available for only a few metal/nonmetal companies, and these data are not representative of the entire industry. Further, each commodity has a unique market demand structure. The following discussion focuses on market forces affecting a few specific commodities within the metal/nonmetal industry.

2. Metal Mining

Historically, the value of metals production has exhibited considerable instability. In the early 1980's, excess capacity, large inventories, and weak demand depressed the international market for metals while the strong dollar placed U.S. producers at a competitive disadvantage relative to foreign producers. Reacting to this, many metal mining companies reduced workforces, eliminated marginal facilities, sold non-core businesses, and restructured. At the same time, new mining technologies were developed, and wage increases were restrained. As a result, the metal mining firms now operating are more efficient and have lower break-even prices than those that operated in the 1970s. Copper, aluminum, gold, and iron are among the highest revenue producers of the metal industry. These metal commodities are discussed in more detail below.

(a) *Copper*

Domestic copper mine production in 1997 was essentially unchanged at 1.9 million metric tons valued at $4.6 billion. The 5 principal producing copper states are, in descending order, Arizona, Utah, New Mexico, Nevada, and Montana. These states accounted for 98 percent of domestic copper production. Copper and copper alloy products are used in building construction, electric and electronic products, industrial machinery and equipment, transportation equipment, and in consumer products. Consumption of refined copper in the United States in 1997 was projected to increase by 4 percent due to the strong demand for wire mill products.[15]

(b) *Aluminum*

The transportation and packaging industries continue to be the dominant U.S. market for aluminum. Domestic primary aluminum production remained relatively stable in 1997. Domestic smelters continued to operate at about 85 percent of capacity.[16] In 1997, 13 companies operated 22 primary aluminum reduction plants. Montana, Oregon, and Washington accounted for 40 percent of the production while Kentucky, North Carolina, South Carolina, and Tennessee accounted for an additional 20 percent.

(c) *Gold*

Gold was produced by about 70 major lode mines, a dozen or more large placer mines, nearly all in Alaska, and numerous small placer mines, mostly in Alaska and in the Western States. The value of 1997 mine production was about $3.4 billion. Commercial-grade refined gold came from about two dozen producers. A few dozen companies, out of several thousand companies and artisans, dominated the fabrication of gold into commercial products. Domestic gold mine production in 1997 was estimated at slightly below the record levels of 1992 and 1993, but high enough to maintain the United States' position as the world's second largest gold producing nation, after South Africa. Domestic output continued to be dominated by Nevada and California, where combined production accounted for nearly 75 percent of the U.S. total.[17]

(d) *Iron Ore*

The value of usable iron ore shipped from mines in the United Sates in 1997 was estimated at about $1.7 billion. Iron ore was produced by 14 companies operating 14 mines (13 open pits and 1 underground operation), 10 concentration plants, and 10 pelletizing plants. Nine mines operated by 5 companies accounted for 98.7 percent of production.[18]

3. Nonmetal Mining, Including Stone and Sand and Gravel

Nonmetal mine production is valued at more than $27.1 billion ($14.4 billion for nonmetals, $7.9 billion for stone, and $4.8 billion for sand and gravel). Major commodities in the nonmetal category include salt, clay, phosphate rock, and soda ash. Market demand for these products tends not to vary greatly with fluctuations in aggregate demand. The U.S. is the largest producer of soda ash and salt. In 1997, the U.S. produced 10.4 million metric tons of soda ash, valued at $882 million, and 41.7 million metric tons of salt, valued at $960 million.[19] Soda ash is used in the production of glass, soap, detergents, paper, and food. Salt is used in highway deicing, food production, feedstock, and the chemical industry. Phosphate rock is used primarily to manufacture fertilizer. Approximately 46.5 million metric tons of phosphate rock, valued at $1,100 million, was produced in the U.S. in 1997.[20] The remaining nonmetal commodities, which include boron fluorspar, oil shale, and other minerals, are typically produced by a small number of mines.

Stone production includes granite, limestone, marble, slate, and other forms of crushed and broken or dimension stone. Sand and gravel products and stone products, including cement, have a cyclical demand structure. As a recession intensifies, demand for these products sharply decreases. Demand for stone, particularly crushed, is expected to grow by as much as 4.0

percent annually, and demand for sand and gravel by about 1.5 percent annually.[21]

In 1997 capacity utilization for stone and earth minerals was about 85 percent.[22] Demand for most industrial minerals, especially crushed stone and cement, increased relative to the previous year. In addition, the Federal highway and mass transit program is expected to continue to provide an impetus for consumption of stone, and sand and gravel. The demand for mineral fertilizer materials (i.e., fixed nitrogen, phosphate rock, potash, and sulfur) is expected to be strong in the coming year because low world stocks of grains and oilseeds should stimulate increased planting domestically and worldwide.[23]

III. BENEFITS OF COMPLIANCE

A. SUMMARY

Noise is one of the most pervasive health hazards in mining. Exposure to hazardous sound levels results in the development of occupational noise-induced hearing loss (NIHL), a serious physical, psychological, and social problem. There is a wealth of information on the relationship between noise exposure and its auditory (hearing loss) and non-auditory (physiological and psychosocial) effects. This information is discussed in more detail in the preamble to the final rule.

In publishing this final rule, MSHA expects miners and the mining community to receive numerous benefits. The greatest benefit is the reduction in the number and severity of cases of NIHL. MSHA expects that implementation of the provisions in the final rule will reduce the number of projected cases of noise-induced hearing impairment by about 64.4%. This translates to a savings of about 23,809 cases of hearing impairment (595 cases per year for a 40-year working lifetime). Reduced incidence of NIHL will result in savings in the costs of worker's compensation claims, lost productivity, and medical expenses, as well as the unquantifiable costs of disruption to the lifestyle of a NIHL-afflicted person.

B. NATURE OF THE HAZARD

1. Hearing Loss

Research has shown that prolonged exposure to high sound levels, such as the levels found in mining, leads to the development of NIHL. The National Institute for Occupational Safety and Health (NIOSH) has identified the ten leading work-related diseases and injuries in the publication, "Final National Strategies for the Prevention of Leading Work-Related Diseases and Injuries, Part 2." According to NIOSH, NIHL is among these "top ten" diseases and injuries. All occupational health professionals in the field agree that NIHL can be diagnosed and prevented. This final rule will contribute to that end by requiring actions (1) to reduce the exposure of miners to hazardous sound levels and (2) to monitor miners' hearing levels so as to identify and stop the progression of NIHL.

NIHL can be temporary or permanent depending on the intensity and duration of the noise exposure. Temporary hearing loss results from short-term exposures to hazardous sound levels, with normal hearing returning after a period of acoustic rest. Generally, permanent damage to the inner ear hair cells or the auditory nerve--and, thus, permanent hearing loss--results from prolonged exposure to hazardous sound levels over a period of several years: the higher the noise exposure, the more rapid the loss. This damage may occur so gradually that the noise-exposed

person often does not become aware of it until after a substantial amount of hearing is lost. For this reason, it is more important to treat high noise levels early.

Damage to the auditory nerve makes it difficult to hear as well as understand speech. People with significant NIHL are often frustrated by missing information that is vital for social or vocational functioning, which can, in turn, produce other workplace safety hazards. People around them need to speak louder and more clearly to be understood. In addition, background noise has a much more disruptive effect on hearing-impaired individuals because they are less able to differentiate between the wanted signal and the unwanted background noise.

Once hearing is lost or diminished, the ability to discern words and understand speech cannot be restored via medical treatment, prolonged exposure to silence, or the use of a hearing aid. Although people with NIHL sometimes can benefit from the use of hearing aids, the hearing aid can never "correct" a hearing loss by restoring a person’s former hearing acuity. Hearing aids function primarily by amplifying sound, both the wanted speech signals and the unwanted noise, usually without making it clearer.

2. Other Effects of Noise and NIHL

Although MSHA recognizes that non-auditory effects of noise can be significant, they are difficult to identify, document, and quantify. By contrast, the auditory risks have a well-established dose-response relationship and, thus, provide a solid foundation on which to base regulatory action. Numerous studies have implicated noise and NIHL as a possible causative factor in a variety of problem areas that adversely affect a person's physical and mental well-being, and can adversely impact productivity and contribute to accidents. See the preamble for a detailed discussion of these studies.

Recognizing these non-auditory effects of NIHL and noisy work environments, in EARLog 6, "Extra-Auditory Benefits of a Hearing Conservation Program,"[24] Berger suggests that an effective hearing conservation program (HCP) may not only prevent NIHL, but also improve general employee health and productivity. MSHA also expects that reducing sound levels and protecting miners from hazardous noise exposures will lessen the adverse non-auditory effects of NIHL and noisy work environments. During the rulemaking process, MSHA requested specific data to aid in the quantification of the non-auditory impact of high noise exposures; however, no data were submitted.

3. Risk of Impairment

The preamble to the final rule discusses the full range of NIHL risk estimates from available data. Among the points noted in the preamble is that all the studies of the risk of NIHL available in the literature measure the risk of acquiring a 25 dB hearing level (deviation from audiometric zero). While all the studies are consistent in this regard, not all the studies measured hearing levels using the same sound frequencies. As discussed in the preamble, MSHA contends that, to assess the risk to workers, NIHL needs to be measured at those frequencies that affect a person's ability to understand speech under everyday (noisy) conditions. This is compatible with the approach taken by both OSHA and NIOSH.

The following table summarizes the excess risk of developing a material impairment of hearing according to the OSHA/NIOSH definition of material impairment as discussed in the preamble, and on which MSHA bases its definition of material impairment.

Sound Level in dBA	Excess Risk (%)*			
	NIOSH[a] (1972)[25]	Melnick, et al.[26]	Burns & Robinson[27]	Range
80	3.0	0.2	8.0	0.2 - 8.0
85	16.0	3.0	15.0	3.0 - 16.0
90	29.0	9.4	28.0	9.4 - 29.0

* If exposed to the specified sound levels over a working lifetime.

[a] OSHA followed the NIOSH definition

Other U.S. and foreign studies have found similar levels of excess risk. Based on these studies, MSHA concludes that miners exposed to sound levels at or exceeding 85 dBA for a working lifetime are at significant risk of developing a material impairment of hearing.

MSHA used the risk data presented in the NIOSH Criteria Document (1972) on occupational exposure to noise, together with projected exposure profiles, to quantify the numbers of miners estimated to incur a material impairment of hearing. (See the "Quantification of Benefits" section below.) MSHA chose to use the NIOSH (1972) data for quantifying risk because—-

(1) In the Mine Act, NIOSH is the designated research agency for the health of miners;

(2) the NIOSH Criteria Document (1972) evaluated and considered a large number of studies on occupational noise exposure to develop its risk assessment; and

(3) the NIOSH Criteria Document presents an estimate of excess risk for a wide range of exposure levels.

The following risk estimates are for persons aged 55 to 70 with 21 to 41 years of exposure at these levels.

Exposure (dBA)	<80	80	85	90	95	≥ 100
% Impaired*	0%	3%	16%	29%	43%	54%

* A hearing level in either ear of 25 dB or greater averaged over 1000, 2000, and 3000 Hertz.

NIOSH played an important role in the Agency's development of risk and hazard assessments of NIHL in miners. NIOSH examined audiometric test data provided by MSHA.[28] The NIOSH study supports conclusions from earlier studies that miners are losing their hearing at a greater rate than the general population. (The preamble contains a lengthy discussion of the NIOSH studies.)

NIOSH also worked on revising its Criteria Document and its estimates using a different model than the one described here and taking hearing loss at an additional frequency into account. However, the Criteria Document had not been made available nor peer-reviewed and approved, at the time MSHA released the proposed rule (although it has since been peer-reviewed and published.) For that reason, MSHA relied upon the 1972 estimates when the Agency published the proposal. For the final rule, MSHA has continued to rely on the 1972 estimates. Its reasons are fully discussed in the preamble to the final rule, as are the differences in the recommendations of the draft and the final Criteria Document.

4. Sources of Exposure and Level of Risk

Permanent hearing loss can result from overexposure to the many sources of noise in mining. Research indicates that mining ranks second, after airfields at which jet engines are present, as the loudest industrial setting. These high sound levels come primarily from mining equipment, as well as from blasting and reverberations from mine walls. The following list presents typical sound levels of some types of mining equipment without noise controls.[29]

Surface Mining Equipment	Sound Levels
Rotary Drills	75 - 100 dBA
Machine-Mounted Percussion Drills	100 - 118 dBA
Electric Shovels, Draglines	72 - 89 dBA
Haulage Trucks	85 - 110 dBA
Front-End Loaders	95 - 102 dBA

Underground Mining Equipment	Sound Levels
Percussion Drills	112 - 120 dBA
Continuous Miner	97 - 108 dBA
Chain Conveyors	92 - 110 dBA
Roof Bolters	92 - 100 dBA
Electric Shuttle Cars	86 - 92 dBA
Diesel-Powered Man Carriers	80 - 100 dBA
Face Ventilation Systems	90 - 110 dBA

Prep & Processing Plant Equipment	Sound Levels
Crushing/Breaking/Screening Equipment	90 - 100 dBA
Car Shake-Outs	110 - 125 dBA
Vacuum Pumps, Fans and Blowers	95 - 100 dBA
Chutes and Hoppers	100 - 105 dBA

For many years, the mining industry and the public in general accepted the risk of acquiring an NIHL as an inevitable

consequence of working in a mine. MSHA established standards for noise exposure in underground and surface coal mines (30 CFR 70.500 and 71.800) and metal/nonmetal mines (30 CFR 56/57.5050) to reduce and control this risk. Quieter equipment, isolation of workers from noise sources, and limiting the duration of worker exposure are among the many, well-accepted methods now used to reduce the incidence of NIHL. Despite MSHA's efforts, hearing loss among miners continues to be a problem.

Data from an MSHA survey of coal miners have shown that the existing standards are not preventing material impairment of hearing among miners. On behalf of MSHA, NIOSH conducted a preliminary analysis of coal miners' audiograms. Limiting the analysis to young coal miners (less than 40 years of age), who would have worked only after MSHA noise regulations were implemented, the preliminary analysis showed that about 14% are experiencing a hearing loss as defined by the NIOSH/OSHA criteria. MSHA projects that full compliance with the final standards for noise will prevent a significant number of these NIHL cases.

C. QUANTIFICATION OF BENEFITS

1. Dual Threshold Survey

In March 1991, MSHA inspectors began collecting noise exposure samples during regular inspections using personal noise

dosimeters that simultaneously accumulated dose at an 80 dBA threshold (low threshold level - LTL) and a 90 dBA threshold (high threshold level - HTL). MSHA inspectors normally collect enforcement samples using a 90 dBA threshold. Collecting samples simultaneously using both thresholds enabled the Agency to evaluate and quantify the incremental impact of a permissible exposure level based on an 80 dBA threshold. All other dosimeter settings were the same as those used during normal compliance inspections (i.e., the 90 dB criterion level, 5-dB exchange rate, and A-weighting system). MSHA refers to this inspector study as the dual-threshold survey and discusses it in greater detail in the preamble to the final rule.

MSHA inspectors collected about 42,000 dual-threshold samples from March 1991 through December 1994 at metal/nonmetal mines and about 4,200 samples from March 1991 through December 1995 at coal mines. The results of this study are summarized as follows.

Threshold Level **TWA_8 Exposures in dBA**

COAL	**80-84.9**	**85-89.9**	**90-94.9**	**95-99.9**	**100-104.99**	**≥ 105**
HTL (90 dBA)	--	--	19.59%	4.40%	1.13%	0.19%
LTL (80 dBA)	16.03%	41.39%	28.77%	5.46%	1.13%	0.19%

Threshold Level	TWA_8 Exposures in dBA					
M/NM	**80-84.9**	**85-89.9**	**90-94.9**	**95-99.9**	**100-104.99**	**≥ 105**
HTL (90 dBA)	--	--	12.65%	3.46%	1.06%	0.27%
LTL (80 dBA)	20.29%	40.52%	20.91%	4.08%	1.13%	0.28%

The dual-threshold survey confirmed that integrating the sound levels between 80 dBA and 90 dBA into the noise exposure generally increases the measured noise dose. The greater the amount of noise between 80 dBA and 90 dBA, the greater the impact. For the purpose of the following analysis, MSHA used the HTL noise exposure sampling data which reflect the requirements of the final rule for the PEL. The Agency used LTL data for computations related to the action level.

MSHA has conducted further analysis of the data since the proposed rule was published.[30] Using a sample of 4,247 full shift inspector-collected noise samples, MSHA found that 25.2% of coal miner samples exceeded the PEL -- using the 90 dB threshold. Further, 76.6% of these samples equaled or exceeded the action level, with the 80 dB threshold. MSHA found few samples that exceeded the 800% dose limit of 105 dBA for dual hearing protection.

2. Methodology

To determine the number of cases of material impairment of hearing expected to be prevented by the final rule, MSHA first

estimated the number of cases of hearing impairment expected under existing exposure conditions. MSHA then estimated the potential reduction in numbers of cases of hearing impairment expected to result from the implementation of the final rule's provisions concerning the use of additional engineering and administrative controls. Finally, MSHA estimated the potential reduction expected to result from the additional use of hearing protectors. The following steps describe this process.

(a) *Baseline Risk of Impairment under MSHA's Existing Standards and Exposure Conditions*

Step 1. Adjustment of Individual Data Elements

The baseline for risk calculations is best approximated by the use of LTL data because there is significant risk of hearing impairment to sound levels between 80 dBA and 90 dBA. Had the Agency used HTL data to determine risk of impairment, the estimates would have been too low because HTL measurements do not integrate sound levels below 90 dBA. Under existing exposure conditions and sampling methods, MSHA assumes that mine operators currently issue personal hearing protectors to miners exposed at or above the PEL, that miners are using the hearing protectors, and that such protection reduces the miner's equivalent TWA_8 noise exposure by 5 dBA. MSHA studies indicate that the amount of reduction achieved by hearing protectors under conditions of use is 5 dBA at a 95% confidence level ($\alpha = 0.05$).[31] For these reasons, MSHA adjusted individual samples with an equivalent HTL

TWA_8 reading at or above 90 dBA by subtracting 5 dBA from the equivalent LTL dBA dose. In addition, MSHA adjusted the LTL dose by 10 dBA for metal/nonmetal samples with an HTL reading at or above an equivalent TWA_8 of 105 dBA to account for the current use of dual hearing protection.

Step 2. Sample Distribution

The distribution of sampling data after adjustment for the use of hearing protectors under existing standards and exposure conditions is provided in the following table. The action level is calculated using an 80 (LTL) threshold and the PEL is calculated using a 90 dB (HTL) threshold.

Percent of Samples at Equivalent TWA_8 Exposure Levels by Commodity*

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total
COAL	7.02%	16.03%	70.95%	4.7%	1.1%	0.2%	0.00%	100%
M/NM	12.8%	20.3%	53.95%	11.6%	1.3%	0.05%	0.00%	100%

* Distribution of miner exposure > 90 HTL reflects a 5 dB reduction for existing use of hearing protectors.

Step 3. Exposure Profile

The estimated number of miners in each exposure range, under existing standards and exposure conditions, is calculated by multiplying the percentage of samples in each exposure range (as derived in Step 2: Sample Distribution) by the total number of coal and metal/nonmetal miners. The following table presents the results:

Number of Miners at Equivalent TWA_8 Exposure Levels by Commodity

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	6,774	15,467	68,459	4,535	1,061	192	1	96,489
M/NM	22,942	36,385	96,698	20,792	2,330	90	0	179,237
Total*	29,716	51,852	165,157	25,327	3,391	282	1	275,726

* Includes contractor employees. Does not include office workers. The total number of miners potentially affected by the final rule is derived in Table IV-6. Discrepancies are due to rounding.

Step 4. Projected Number of Impairments

By using the NIOSH point estimates of risk to represent exposures over a range, MSHA underestimates the number of cases of hearing impairment expected to occur. For example, NIOSH estimated that the risk of incurring a hearing impairment is 3% at 80 dBA. MSHA applies this risk estimate to all exposures from 80 dBA to 84.99 dBA. In fact, the risk for exposures at 84.99 dBA is closer to 16%, the NIOSH estimate of risk for exposures at 85 dBA.

This analysis does not take into account the movement of miners to jobs with lower noise exposures nor miners with a working life of 20 years or less (either of which would lower the expected number of cases of NIHL). Also, this analysis does not include office workers because MSHA's sampling data do not represent this job group, and MSHA does not expect that normal noise exposures for this group exceed a level that presents a risk of hearing impairment.

The projected number of impairments, under existing standards and exposure conditions, calculated by multiplying the NIOSH (1972) risk estimates for each exposure range by the number

of miners in each range (as derived in Step 3: Exposure Profile). Table III-1 provides the results, along with the corresponding percentage of miners in each exposure range likely to incur NIHL impairment under existing standards and exposure conditions:

TABLE III-1: Projected Number and Percentage of Miners Likely to Incur NIHL Impairment under Existing Standards and Exposure Conditions

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	0	464	10,954	1,315	456	104	1	13,294
M/NM	0	1,091	15,472	6,030	1,002	48	0	23,643
Total*	0	1,555	26,426	7,345	1,458	152	1	36,937
Percentage	0%	3%	16%	29%	43%	54%	100%	13.4%

* Includes contractor employees. Does not include office workers. Discrepancies are due to rounding.

(b) *Impact of Final Standards*

(1) *Impact of Engineering and Administrative Controls*

Step 1. Adjustment of Individual Data Elements

MSHA adjusted the values of individual HTL samples (data elements) to account for use of additional engineering and administrative controls to comply with the final rule. Adjustments were based upon the expected impact of installing additional feasible engineering controls and using administrative controls within each job group.

Coal Mining

Current enforcement efforts among coal mining operations allow the use of hearing protectors in lieu of engineering and administrative controls to comply with the PEL. As a result,

MSHA anticipates that almost all coal miners will benefit from the installation and maintenance of feasible engineering controls because such controls reduce the overall sound level in the mine environment. For the purpose of quantifying benefits in this analysis, MSHA adjusted all coal HTL samples by at least 3 dBA to account for the overall reduction in sound levels in the mine environment as a result of the widespread use of engineering controls.

MSHA next adjusted coal HTL samples within specific job groups to reflect the direct benefit expected from engineering or administrative controls. MSHA expects engineering controls to be the primary means of control for most job groups. Depending on MSHA's assessment of the technological feasibility for the use of engineering controls in a specific job group, MSHA applied an additional adjustment of 3 to 6 dBA. For a few job groups where administrative controls are the primary control method (e.g., blasters, electricians, mechanics) the adjustment for administrative controls was 3 dBA.

Finally, MSHA adjusted those samples which continued to exceed an equivalent HTL TWA_8 of 90 dBA by subtracting an additional 3 dBA to reflect the increased use of administrative controls. Because the Agency has determined that administrative controls are feasible for most jobs at coal mines, the Agency contends that it is feasible for mine operators to use additional administrative controls in those few situations where

implementation of the usual engineering and administrative controls are inadequate to reduce a miner's exposure below the PEL.

Metal/Nonmetal Mining

For metal/nonmetal mines, MSHA currently requires the use of engineering or administrative controls to the extent feasible to reduce exposures to the PEL. Under existing standards if the PEL cannot be achieved, hearing protectors must be made available to miners. In addition, MSHA policy requires those exposed at or above an equivalent HTL TWA_8 of 105 dBA to use dual hearing protection. MSHA therefore concludes that the benefits from the additional installation and maintenance of engineering controls to comply with the final rule will accrue primarily to those miners whose noise exposures are only marginally in compliance with the existing standards.

In addition, the final rule enacts no changes in the need to use engineering controls to meet the PEL. MSHA assumes that metal/nonmetal mine operators would begin to explore new methods of administrative controls. However, MSHA anticipates that few metal/nonmetal mines would find the use of administrative controls feasible for many situations in metal/nonmetal mining. Furthermore, the Agency's experience reveals that few work situations still face feasibility problems. MSHA considered all

these issues in calculating the benefits (and costs) of engineering and administrative controls.

Step 2. Sample Distribution

The distribution of HTL sampling data, after adjustment for implementing additional engineering and administrative controls under the final rule, is as follows:

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	14.76%	56.70%	27.12%	1.3%	0.1%	0.02%	0%	100%
M/NM	12.78%	22.71%	56.01%	7.21%	1.24%	0.05%	0%	100%

* Discrepancies are due to rounding

Step 3. Exposure Profile

The number of miners in each exposure range, after adjustment for the additional use of engineering and administrative controls under the final rule, is as follows:

Number of Miners at Equivalent TWA_8 Exposure Levels by Commodity

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	14,242	54,709	26,168	1,254	97	19	0	96,489
M/NM	22,907	40,705	100,391	12,923	2,223	90	0	179,238
Total *	37,149	95,414	126,559	14,177	2,320	109	0	275,727

* Includes contractor employees. Does not include office workers. Discrepancies are due to rounding.

Step 4. *Projected Number of Impairments*

The projected number of impairments, after implementation of additional engineering and administrative controls under the final rule, is as follows:

Projected Impairments at Equivalent TWA_8 Exposure Levels by Commodity

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	0	1,641	4,187	364	41	11	0	6,244
M/NM	0	1,221	16,063	3,747	956	48	0	22,035
Total*	0	2,862	20,250	4,111	997	59	0	28,279

* Includes contractor employees. Does not include office workers. Discrepancies are due to rounding.

The estimated incremental impact of the use of additional engineering and administrative controls under the final rule is as follows:

TABLE III-2: Projected Number of Miners' Cases of NIHL Impairment Likely to Be Prevented by Final Rule Provisions for ENG/ADM Controls

Mine Type	# of Impairments Prevented	# Prevented/yr for 40 yrs	% Prevented
COAL	7,050	176	53.0%
M/NM	1,608	40	6.8%
TOTAL*	8,658	216	23.4%

* Discrepancies are due to rounding.

(2) *Impact of Hearing Protectors*

Step 1. Adjustment of Individual Data Elements

If a miner's noise exposure equals or exceeds the action level (an equivalent LTL TWA_8 of 85 dBA) but does not exceed the

PEL, the final rule requires the operator to enroll the miner in a hearing conservation program that offers annual audiometric examinations, personal hearing protectors, and noise training. Miners exposed below the PEL do not have to wear hearing protectors except in a few limited situations. Because the offered hearing protectors are voluntary, the mine operator does not have to ensure that these miners wear them. As discussed in the preamble, the purpose of these requirements is to provide additional protection for miners because (1) there is significant risk of material impairment of hearing from lifetime exposure at an LTL TWA_8 of 85 dBA; and (2) MSHA has concluded that it is not currently feasible in all situations for the use of engineering and administrative controls alone to reduce miners' noise exposures to this level.

For the purpose of this analysis, MSHA assumed that all miners exposed at or above the action level, but below the PEL, will request and use hearing protection. Because of uncertainties attendant to audiometric examinations, MSHA did not quantify the possible benefits from audiometric examinations. Accordingly, MSHA adjusted the values of individual samples (data elements) by subtracting an additional 5 dBA to account for this additional use of hearing protectors under the provisions of the final rule. The requirement to provide hearing protectors as supplementary protection when a miner's exposure exceeds the PEL remains unchanged from the existing rule. The adjusted hearing

protector exposure profile accounts for the use of hearing protectors by those additional miners exposed above an equivalent LTL TWA_8 of 85 dBA, and the use of dual hearing protection by those miners exposed above an equivalent HTL TWA_8 of 105 dBA, who are not expected to already be using hearing protectors under existing exposure conditions.

Step 2. Sample Distribution

The distribution of sampling data, after additional adjustment for the use of hearing protectors under the final rule, is described in the table which follows. The action level

is calculated using an 80 dB threshold (LTL) and the PEL is calculated using a 90 dB threshold (HTL).

	<80	**80-84.9**	**85-89.9**	**90-94.9**	**95-99.9**	**100-104.99**	**≥105**	**Total**
COAL	14.76%	82.81%	1.04%	1.27%	0.12%	0%	0%	100%
M/NM	12.78%	69.7%	13%	3.22%	1.24%	0.05%	0%	100%

Step 3. Exposure Profile

The number of miners in each exposure range, after adjustment for the additional use of hearing protectors under the final rule, is as follows:

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	14,242	79,903	1,004	1,225	116	19	0	96,509
M/NM	22,942	124,929	23,301	5,772	2,223	90	0	179,257
Total*	37,184	204,832	24,305	6,997	2,339	109	0	275,766

* Includes contractor employees. Does not include office workers. Discrepancies are due to rounding.

Step 4. Projected Number of Impairments

The projected number of impairments, after the use of additional hearing protectors under the final rule, is as follows:

	<80	80-84.9	85-89.9	90-94.9	95-99.9	100-104.99	≥105	Total*
COAL	0	2,397	161	355	50	11	0	2,974
M/NM	0	3,748	3,728	1,674	956	48	0	10,154
Total*	0	6,145	3,889	2,029	1,006	59	0	13,128

* Includes contractor employees. Does not include office workers. Discrepancies are due to rounding.

The estimated incremental impact of the use of additional hearing protectors under the final rule is as follows:

TABLE III-3: Number of Cases of NIHL Impairment Estimated to Be Prevented by Final Rule Provisions for Hearing Protectors

Mine Type	# of Impairments Prevented	# Prevented/yr for 40 yrs	% Prevented
COAL	3,270	82	24.6%
M/NM	11,881	297	50.2%
TOTAL*	15,151	379	41.0%

* Discrepancies are due to rounding.

(c) *Total Number of Hearing Impairments Prevented by Final Rule*

The total projected number of cases of hearing impairment that will be prevented by the final rule are presented in Table III-4. The final rule will reduce the number of cases of noise-induced hearing impairment projected under current exposure levels by about 64.4%. This is equivalent to about 23,809 cases of hearing impairment prevented, or about 595 cases per year over a 40-year working lifetime. The benefits will start accruing immediately, and the annual number of cases of NIHL prevented will increase until the equilibrium value is reached in 21-41 years (relative to continued exposure at current levels over a working lifetime).

TABLE III-4: Total Number of Miners' Cases of NIHL Impairment Estimated to Be Prevented by Final Rule

Final Provisions	Coal		Metal/Nonmetal		Total*	
	# Cases	% Reduction	# Cases	% Reduction	# Cases	% Reduction
ENG/ADM	7,050	53.0%	1,608	6.8%	8,658	23.4%
Hearing Protectors	3,270	24.6%	11,881	50.2%	15,151	41.0%
Total*	10,320	77.6%	13,489	57.0%	23,809	64.4%

* Discrepancies are due to rounding.

MSHA performed an additional analysis to ascertain the effects of the final rule on small mines (using MSHA's traditional definition of fewer than 20 employees). MSHA followed the procedures described in the sections above using only that portion of noise samples collected at small mines. This analysis showed that the final rule would have a slightly larger impact on small mines than on large mines in terms of reducing the number of NIHL cases. Similar results were noted when using the SBA definition of a small mine (one with 500 or fewer employees).

3. Workers' Compensation

Society pays millions of dollars per year in workers' compensation costs for NIHL claims. MSHA expects the final rule will reduce the number of cases of hearing impairment; the Agency also expects industry costs for workers' compensation claims to

decrease. Although MSHA has not monetized these benefits, the Agency has quantified the number of NIHL cases to be prevented.

Additionally, although MSHA expects a reduction in the numbers of miners suffering from noise-related physiological problems and a decline in the number of injuries resulting from noise-related accidents as well as productivity improvements, the Agency is unable to quantify these impacts or the associated reduction in medical expenses with precision. During the rulemaking process, MSHA requested data to aid in the quantification of these benefits; however, no relevant information was submitted.

4. Comments Received

MSHA received few comments on its benefits assessment for the proposed rule. A commenter stated that the "risk analysis very likely overstates the levels of noise in metal and nonmetal mines." The commenter did not provide a specific rationale to support this assertion or suggest a means of recalculating the noise exposures.

Another commenter stated "In our opinion changing the existing noise standards will have no effect on the reduction of noise for employees in this mining group." This commenter, a metal/nonmetal company which is already obligated to comply with the primacy of feasible engineering and administrative controls,

did not suggest why it believed that these controls will continue to be ineffective. For metal/nonmetal operators, as explained earlier, in its computation of benefits, MSHA assumed that, to the extent feasible, these operators were in compliance with existing requirements.

Two coal companies provided identical comments which stated "The very basic premise on upon which this proposal was apparently founded, miners at risk, appears also flawed when consideration is given to the use of personal hearing protection device." MSHA's assessment of the at risk population, as described in the proposal's RIA and in this final rule's REA, did consider the benefits derived from the use of hearing protectors. However, an excess risk still exists after initial consideration of hearing protectors is factored in.

Further, another commenter stated that it believed that the studies showing the risks of hearing loss in miners are "... 'seriously flawed' resulting in significant over-estimations of the hazard to hearing posed by occupational exposure to noise for coal miners." MSHA disagrees with the commenter, and MSHA responds to these comments in the preamble.

Another commenter stated in written comments "... Furthermore, accuracy and appropriateness of the risk analysis and cost estimates of the subject proposed rules critically depend upon the Agency clearly identifying, using and

differentiating between noise and noise exposure or sound and sound exposure level in consistent and proper ways." This commenter did not elaborate on how MSHA allegedly had not done this; nor did the commenter provide any suggestions for reassessing the risk.

A different commenter questioned MSHA estimates for the numbers of coal and metal/nonmetal miners who will be saved from NIHL. The commenter wrote that "MSHA has indicated that there will be 15,300 miners in metal/nonmetal and 15,300 miners in coal who's [sic] hearing will be saved as a result of these proposed regulations. We find it unlikely that exactly the same number of miners' hearing will be saved in coal and metal/nonmetal. There are significant differences between both the population and the demographics between metal/nonmetal and coal. This indicates that MSHA has no real basis for this statement. We request that MSHA review its calculations to realistically portray the anticipated benefits of the proposed regulations." In the proposed RIA, MSHA clearly delineated between the populations of workers covered, metal and nonmetal versus coal, and the regiments for each, then based on existing requirements versus the proposed requirements. The Agency calculated that 15,304 coal miners and 15,283 metal/nonmetal miners will be spared NIHL as calculated in the proposed rule's RIA (or PRIA, for short) using a LTL in its methodology; the analysis is summarized on

page 42 of the PRIA and is described in steps on pages 31 through 42 of the PRIA. The majority of these coal cases were prevented by the implementation of engineering and administration controls (11,072 cases of 15,304 total cases or 72% of the total). The majority of these metal/nonmetal cases were prevented by the use of hearing protectors at the noise levels of 85 to 90 dBA (12,320 cases of 15,283 total cases or 80.6% of the total). Although the metal/nonmetal industry has many more employees than the coal industry, its noise exposures, due to differences in existing requirements, made the benefits estimates similar. The final rule's REA has calculated benefits using a threshold of 90 dB at the PEL, as opposed to the 80 dB threshold included in the proposed rule; therefore, the benefits estimates presented here differ from those in the PRIA. In addition, there has been an increase in the total number of metal/nonmetal miners and a decrease in the total number of coal miners since the publication of the proposed rule and its RIA; these factors have also affected MSHA's new calculations.

Another commenter believed that MSHA had combined its estimated benefits with its cost estimates. As is required by Executive Order 12866, and provided in this analysis, MSHA separated the estimated benefits and costs in both its proposed rule's RIA and in this final rule's REA. In neither document did MSHA "offset" or "wash out" the direct costs with the estimated

benefits. As is its responsibility, MSHA has taken care to assure that the public is aware of both the costs and benefits of the final rule.

MSHA estimates that, in addition to the “tangible” direct benefits of the rule, there exist several indirect benefits that mine operators and miners will derive as a result of the final rule. In particular, the implementation of certain engineering controls, such as mufflers and barriers, can actually improve air quality. This, in turn, helps to prevent certain respiratory ailments that occur as a result of the inhalation of environmental pollutants. Furthermore, MSHA believes that the provisions allowing miners to observe monitoring and those providing for training will aid both the miners’ awareness of efforts to control noise exposures and operators working cooperatively with miners and manufacturers to develop more effective control technology. In addition, MSHA contends that safety will be enhanced by the final rule. The Agency anticipates, in the future, fewer noise-related accidents and injuries in addition to mishaps that occur from poor communication due to hearing loss.

Finally as is discussed in Chapter IV of this REA, coal mines that have noise exposures below the action level will experience reduced administrative and paperwork costs from no longer having to submit biannual noise surveys and perform related tasks.

IV. COST OF COMPLIANCE

A. SUMMARY

MSHA estimates that the total cost of the final rule will be approximately $8.9 million annually, of which about $8.75 million will be borne by mine operators. The annualized cost of the final rule is based on total first year costs (including one-time and annual costs) of $38.4 million and costs of $4.1 million each year thereafter. The annualized cost of the final rule will be approximately $7.38 million for the metal/nonmetal mining industry and approximately $1.37 million for the coal mining industry. The cost of the final rule includes savings arising from the elimination of certain provisions of the existing noise rule, whose requirements MSHA estimates currently cost the coal industry approximately $5.1 million annually. The elimination of these costs will partially offset the new costs for the coal mining industry of approximately $6.5 million resulting from the final rule.

For the purposes of this final regulatory economic analysis, MSHA defines a small mine as one having fewer than 20 employees and a large mine as one with 20 or more employees. In 1997, there were 15,299 mine operators, including independent contractors, potentially affected by the final rule. Of this total, 10,098 were small metal/nonmetal mine operators, and 2,401

were small coal mine operators. MSHA estimates that the average cost for a small metal/nonmetal mine operator will increase by approximately $460 annually due to the final rule. Average costs for a small coal mine operator will increase by approximately $400 per year. Table IV-1 summarizes the net annual costs of the final rule by requirement/provision.

TABLE IV-1: Summary of Annualized Compliance Costs of the Final Rule*

Requirement/ Provision	Coal		Metal/Nonmetal		Total Costs for All Mines	Total Costs for Other Parties	Total Cost
	Small	Large	Small	Large			
Engineering Controls	$ 549,681	$ 2,216,635	$ -	$ -	$ 2,766,316	$ -	$ 2,766,316
Administrative Controls	$ 623	$ 2,281	$ 303	$ 1,967	$ 5,174	$ -	$ 5,174
Dose Determination	$ 69,052	$ (959,993)	$ 2,437,907	$ 861,067	$ 2,408,033	$ -	$ 2,408,033
Notification	$ 3,792	$ 15,539	$ 13,822	$ 19,264	$ 52,417	$ -	$ 52,417
Record of Noise Surveys, et al.	$ (438,989)	$ (2,279,861)	-	-	$ (2,718,849)	$ -	$ (2,718,849)
Observation of Monitoring	$ 12,913	$ 27,344	$ 47,112	$ 33,469	$ 120,838	$ 160,700	$ 281,538
§ 62.160	$ 35,412	$ 18,872	$ 518,186	$ 115,300	$ 687,771	$ -	$ 687,771
§ 62.170	$ 167,367	$ 841,248	$ 599,682	$ 1,009,362	$ 2,617,658	$ -	$ 2,617,658
§ 62.171	$ 7,200	$ 25,375	$ 26,418	$ 31,764	$ 90,756	$ -	$ 90,756
§ 62.172	$ 35,323	$ 146,188	$ 128,535	$ 176,372	$ 486,417	$ -	$ 486,417
§ 62.173	$ 3,093	$ 19,372	$ 11,200	$ 23,426	$ 57,090	$ -	$ 57,090
§ 62.174	$ 5,086	$ 16,672	$ 17,253	$ 18,588	$ 57,599	$ -	$ 57,599
§ 62.175	$ 7,467	$ 25,493	$ 27,362	$ 31,895	$ 92,217	$ -	$ 92,217
§ 62.180	$ 140,181	$ 642,153	$ 470,379	$ 716,177	$ 1,968,890	$ -	$ 1,968,890
§ 62.190	$ 5,741	$ 5,794	$ 23,123	$ 17,386	$ 52,044	$ -	$ 52,044
Total	$ 603,941	$ 763,112	$ 4,321,282	$ 3,056,036	$ 8,744,371	$ 160,700	$ 8,905,072

*Source: Table IV-10; Table IV-11; Table IV-12; Table IV-13; Table IV-14; Table IV-20; Table IV-25; Table IV-31; Table IV-36; Table IV-39; Table IV-44; Table IV-50; Table IV-58; Table IV-65; and Table IV-72.

Table IV-1 and all other tables in this chapter use the traditional MSHA definition of a small mine as one with fewer than 20 employees.

All MSHA cost estimates are presented in 1997 dollars. The total costs reported in Table IV-1, and in all other tables in this chapter, are, to the best of our knowledge, the result of accurate calculations. In some cases, however, the totals may appear to deviate from the sum or product of their component factors, but that is only because the component factors have been rounded in the tables for purposes of readability.

B. METHODOLOGY

For this final rule, MSHA estimated the following, as appropriate: (1) one-time costs; (2) annualized costs (one-time costs amortized over a specific number of years); and (3) annual costs. One-time costs are those that are incurred once and do not reoccur annually. Capital expenditures, such as the cost of purchasing compliance equipment, are an example of one-time costs. Another example of a one-time cost is the cost to develop a written procedural program. For the purposes of this REA, one-time costs have been amortized using a discount rate of 7% over a 10 year period using the formula:

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

where “a” is the annualization factor, “i” is the discount rate, and “n” is the economic life of the one-time investment. Under the assumption of a discount rate of 7% and an economic life of 10 years, “a” is equal to 0.142 (that is, the annualized cost is equal to 14.2% of the one-time cost). Converting one-time costs to annualized costs allows them to be added to annual costs in order to compute the total yearly costs of a rule.

Annual costs are costs that normally recur annually. Two examples of annual costs are maintenance costs and recordkeeping costs. Unless otherwise stated, MSHA estimates annual operating and maintenance costs for compliance equipment to be 10% of the capital cost of that equipment.

MSHA used an hourly compensation rate of $17 for a clerical worker, $23 for a metal/nonmetal miner, $26 for a coal miner, $36 for a metal/nonmetal supervisor, and $43 for a coal supervisor.[32] These figures include benefits (which include social security, unemployment insurance, and workers’ compensation), but they do not reflect shift differentials or overtime pay. For convenience, MSHA will refer to miner “compensation” as “wages,” where that term is understood to include benefits. The Agency assumed that contractor workers receive the same wage as their fellow coal miners or metal/nonmetal miners.

In estimating the cost of this final rule, MSHA took into account the fact that some mining operations are already in compliance with the requirements of the final rule. Based on the Agency's data on current noise exposure levels and on normal mine management safety practices, MSHA estimated that 5% of small mines and 20% of large mines——both coal and metal and nonmetal mines——are already complying with the final rule's audiometric testing requirements.

Similarly, MSHA did not include office workers in its cost calculations. Although the final rule will cover office workers, MSHA anticipates no separately identifiable costs or benefits to be associated with them. For example, MSHA expects that the costs will be negligible to determine the noise dose of office workers or to provide hearing protection for those workers who occasionally may walk through noisy areas in the performance of their duties.

C. SCOPE

Under current regulations, noise of less than 90 dBA is not included in computing noise exposure. For the proposed rule, MSHA used an 80 dBA threshold for determining exposure levels. In the proposed rule's RIA, the Agency used dual threshold data collected by the Agency from March 1991 through October 1995 to ascertain current exposure levels using an 80 dBA threshold.

The proposed 80 dBA threshold for both the PEL and the action level was met with mixed reaction from the mining industry. As MSHA noted in the proposed rule's RIA, using an 80 dBA threshold will increase the number of mines that have miners overexposed. The costs of compliance will therefore be higher than if a 90 dBA threshold were used. In addition, several commenters believed a 90 dBA threshold was sufficient for miner protection and that compliance with a new 80 dBA threshold would be difficult.

Based on MSHA's consideration of the comments and hearing testimony, the final rule incorporates a dual threshold. It retains the existing 90 dBA threshold for the purpose of determining compliance with the 90 dBA PEL and triggering the need for additional engineering and administrative controls. It also adopts the 80 dBA threshold for determining compliance with the 85 dBA action level for triggering hearing conservation measures, such as audiometric testing.

Table IV-2 indicates the number of coal and metal/nonmetal mines and miners, excluding independent contractors and contractor workers, for both large and small mines. The number of independent contractors and contractor workers by mine type and size is provided in Table IV-3. MSHA estimates that only about half of the contractor workers are directly engaged in mine production or related tasks that involve exposure to elevated

noise levels in the mine. Of those who are, MSHA estimates that half do not work a sufficient number of days in a mine to qualify for participation in an MSHA hearing conservation program or are already covered by an existing OSHA hearing conservation program. Thus, as Table IV-3 shows, only about one quarter of the contractor workers would be potentially affected by the final rule.

TABLE IV-2: Distribution of Mine Operations and Employment by Mine Type and Size*

	Coal			Metal/Nonmetal		
Mine Size (# of employees)	# of Mines	# of Miners	Miners per Mine	# of Mines	# of Miners	Miners per Mine
Small (< 20)	1,511	10,809	7.15	9,384	53,319	5.68
Large (≥ 20)	1,050	78,204	74.48	1,571	116,421	74.11
Total	2,561	89,013	34.76	10,955	169,740	15.49

*Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on preliminary 1997 MIS data (quarter 1- quarter 4, 1997). Office workers and contractors are not included in these employment figures.

TABLE IV-3: Distribution of Independent Contractors and Contractor Workers by Mine Type and Size Potentially Affected by the Final Rule

Type	Small Coal Mines		Large Coal Mines		Small M/NM Mines		Large M/NM Mines	
	# of Contractors	# of Contractor Workers	# of Contractors	# of Contractor Workers	# of Contractors	# of Contractor Workers	# of Contractors	# of Contractor Workers
# of Independent Contractors & Contractor Workers [a]	3,561	14,151	333	15,753	2,855	14,161	381	23,829
Adjustment Factor [b]	25%	25%	25%	25%	25%	25%	25%	25%
# of Potentially Affected Independent Contractors & Contractor Workers	890	3,538	83	3,938	714	3,540	95	5,957

[a] Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on preliminary 1997 MIS data (quarter 1 - quarter 4, 1997). Estimates exclude office workers.

[b] Adjustment factor = j X k, where j is the percentage of contractor workers whose job tasks involve exposure to elevated noise levels in a mine and j=50%; and k is the percentage of contractor workers exposed to elevated noise levels in a mine who are not already covered by an existing OSHA hearing conservation program (HCP) or who do not work a sufficient number of days in a mine to qualify for an MSHA HCP, and k=50%.

In the proposed rule's Regulatory Impact Analysis, MSHA treated independent contractors differently from mine operators and contractor workers differently from miners throughout the analysis. In this final REA, unless otherwise specified, the Agency will treat (1) mine operators and independent contractors potentially affected by the final rule as equivalent and (2) miners and contractor workers potentially affected by the final rule as equivalent. This is in keeping with Section 3(d) of the Federal Mine Safety and Health Act of 1977, which defines an "operator" to include:

> …any owner, lessee, or other person who operates, controls, or supervises a coal or other mine *or any independent contractor performing services or construction at such mine*. [italics added.]

Table IV-4 provides MSHA's estimate of the number of mines and miners, including independent contractors and contractor workers, potentially affected by the final rule.

TABLE IV-4: Distribution of Mine Operations and Employment by Mine Type and Size Including Independent Contractors and Contractor Workers Potentially Affected by the Final Rule*

	Coal			Metal/Nonmetal		
Mine Size (# of employees)	# of Mines	# of Miners	Miners per Mine	# of Mines	# of Miners	Miners per Mine
Small (< 20)	2,401	14,347	5.97	10,098	56,859	5.63
Large (≥ 20)	1,133	82,142	72.48	1,666	122,378	73.45
Total	3,535	96,489	27.30	11,764	179,238	15.24

*Source: Table IV-2 and Table IV-3. Office workers are not included in these employment figures.

Based on the figures in Table IV-2 and MSHA's dual threshold survey, MSHA calculated the number of coal and metal/nonmetal mines and miners, exclusive of independent contractors and contractor workers, in various categories of noise exposure under the final rule. Table IV-5 presents this information.

TABLE IV-5: Distribution of Mine Operations and Employment above Various Noise Exposure Levels*

	Coal				Metal/Nonmetal			
Exposure Level	# of Small Mines	# of Miners	# of Large Mines	# of Miners	# of Small Mines	# of Miners	# of Large Mines	# of Miners
< 85 dBA [a]	435	3,113	224	16,657	3,087	17,542	536	39,700
≥ 85 dBA [a]	1,076	7,696	826	61,547	6,297	35,777	1,035	76,721
Total	1,511	10,809	1,050	78,204	9,384	53,319	1,571	116,421
< 85 dBA [a]	435	3,113	224	16,657	3,087	17,542	536	39,700
≥ 85 dBA but ≤ 90	719	5,145	555	41,370	4,570	25,966	782	57,978
> 90 dBA [b]	357	2,551	271	20,177	1,727	9,811	253	18,744
Total	1,511	10,809	1,050	78,204	9,384	53,319	1,571	116,421

* The number of mines and miners is based on an eight-hour time-weighted average and on an HTL of 90 dBA and an LTL of 85 dBA. Office workers and contractors are not included in these totals.

[a] Based on MSHA's dual threshold survey, the proportion of miners with noise exposures below TWA_8 of 85 dBA is 28.8% for small coal mines, 21.3% for large coal mines, 32.9% for small metal/nonmetal mines, and 34.1% for large metal/nonmetal mines.

[b] Based on MSHA's dual threshold survey, the proportion of miners with noise exposures above TWA_8 of 90 dBA is 23.6% for small coal mines, 25.8% for large coal mines, 18.4% for small metal/nonmetal mines, and 16.1% for large metal/nonmetal mines.

MSHA does not have data to determine the noise exposure of contractor workers, the duration of their employment at a specific mine, or the type of noise preventive personal protective equipment which is supplied to them by their employers. MSHA requested information from the mining public to assist in determining the impact of the rule on contractor workers; however, no information was supplied. To derive an estimate of the rule's impact on contractor workers, MSHA assumed that the distribution of noise exposures for contractor workers potentially affected by the final rule is identical to that for miners. Based on this assumption and the figures presented in Table IV-4, MSHA calculated the number of mine operators and miners, including independent contractors and contractor workers potentially affected by the final rule, exposed to various noise levels in the mine. This information is provided in Table IV-6.

D. SECTION-BY-SECTION DISCUSSION

TABLE IV-6: Distribution of Mine Operations and Employment above Various Noise Exposure Levels Including Independent Contractors and Contractor Workers Potentially Affected by the Final Rule*

	Coal				Metal/Nonmetal			
Current Exposure Level	# of Small Mines	# of Miners	# of Large Mines	# of Miners	# of Small Mines	# of Miners	# of Large Mines	# of Miners
< 85 dBA [a]	692	4,132	241	17,496	3,322	18,707	568	41,731
≥ 85 dBA [a]	1,710	10,215	892	64,646	6,776	38,153	1,098	80,647
Total	2,401	14,347	1,133	82,142	10,098	56,859	1,666	122,378
< 85 dBA [a]	692	4,132	241	17,496	3,322	18,707	568	41,731
≥ 85 dBA but ≤ 90	1,143	6,829	599	43,453	4,918	27,690	830	60,944
> 90 dBA [b]	567	3,386	292	21,193	1,858	10,462	268	19,703
Total	2,401	14,347	1,133	82,142	10,098	56,859	1,666	122,378

* The number of mines and miners is based on an eight-hour time-weighted average and on an HTL of 90 dBA and an LTL of 85 dBA. Office workers are not included in these totals, but potentially affected independent contractors and contractor workers are included. Unless otherwise specified, all future estimates for mine operators and miners in this chapter include potentially affected independent contractors and contractor workers.

[a] Based on MSHA's dual threshold survey, the proportion of miners with noise exposures below TWA_8 of 85 dBA is 28.8% for small coal mines, 21.3% for large coal mines, 32.9% for small metal/nonmetal mines, and 34.1% for large metal/nonmetal mines.

[b] Based on MSHA's dual threshold survey, the proportion of miners with noise exposures above TWA_8 of 90 dBA is 23.6% for small coal mines, 25.8% for large coal mines, 18.4% for small metal/nonmetal mines, and 16.1% for large metal/nonmetal mines.

1. § 62.100 Purpose and Scope; Effective Date, § 62.101 Definitions, § 62.110 Noise Exposure Assessment, § 62.120

D. SECTION-BY-SECTION DISCUSSION

1. § 62.100 Purpose and Scope; Effective Date, § 62.101 Definitions, § 62.110 Noise Exposure Assessment, § 62.120 Action Level, § 62.130 Permissible Exposure Level, § 62.140 Dual Hearing Protection Level, and § 62.150 Hearing Conservation Program

Existing §§ 56.5050, 57.5050, 70.510, and 71.805 require mine operators to use feasible engineering/administrative controls to maintain miners' noise exposure at or below the permissible exposure level of an 8-hour, time-weighted average (TWA_8) of 90 dBA, or as close to it as feasible. Coal mine operators have been permitted to use hearing protectors as a means of meeting this level. Under the final rule, however, they will not be allowed to use hearing protectors to meet the standard unless feasible engineering and administrative controls have been exhausted.

Under current regulations, noise levels of less than 90 dBA are not included in computing noise exposure. Under the final rule, the threshold for integrating sound levels into the noise dose will be 90 dBA for the PEL and 80 dBA for the action level. The exposure level for taking initial action will be at a TWA_8 of 85 dBA, and the PEL will remain at a TWA_8 of 90 dBA. The final rule will also require mine operators to determine the noise dose of each miner.

MSHA contends that the final requirements of the rule are sufficient to provide adequate protection to miners exposed to noise at or above the action level and above the PEL. The establishment of an action level will provide a high level of protection to miners while reducing compliance costs somewhat and is compatible with OSHA's Hearing Conservation Amendment.

If a miner's exposure equals or exceeds the action level, the final rule requires the mine operator to enroll the miner in a hearing conservation program (HCP) offering annual audiometric examinations, hearing protectors, and training. The audiometric testing, hearing protectors, and training must meet specifications set forth in the final rule. If the miner's exposure exceeds the PEL, the operator must implement engineering and administrative controls. In addition, until engineering and adminstrative controls are successfully implemented, the operator must provide a hearing protector and ensure that the miner uses it.

Some mine operators voluntarily provide an HCP with audiometric testing, and a small percentage of coal mine operators are required to provide an HCP due to prior violations of the existing rule. For the purpose of this final REA, MSHA estimates that 5% of small mines with noise exposures at or above a TWA_8 of 85 dBA and 20% of large mines with noise exposures at or

above a TWA_8 of 85 dBA have an existing HCP. MSHA used these same percentages in the proposed rule. During the public hearings, the Agency inquired about existing audiometric testing programs and determined that the proposed estimates were reasonable.

If a miner's exposure exceeds the PEL, the mine operator must use all feasible engineering and administrative controls to reduce the miner's noise exposure to the PEL. If all feasible engineering and administrative controls do not reduce the miner's exposure to the level of the PEL, the operator must use these controls to reduce the miner’s noise exposure to the lowest feasible level. As noted, the operator must also provide a hearing protector to the miner and require its use, offer the miner an audiometric examination, and provide annual noise training. Section 62.110 of the final rule eliminates the existing rule permitting coal mine operators to use hearing protectors in lieu of feasible engineering and administrative controls.

(a) *Engineering Controls/Administrative Controls*

To calculate the costs for engineering controls, MSHA evaluated various engineering controls and their related costs. The engineering controls evaluated include switching to remotely operated equipment, adding mufflers and curtains to equipment, installing acoustical foam and acoustic screens around machinery, and fitting machinery with noise reducing attachments. The

preamble provides a review of the retrofitting options available to the mining industry.

Noise can be minimized at three locations: the source, the path, and the receiver. An example of noise reduction at the source is the control of blowoff air and the use of low-noise air nozzles. Path reduction is achieved by the use of noise curtains or absorptive baffles. Receiver noise reduction controls include soundproofed control rooms or insulated cabs. The four basic methods of controlling noise are: isolation such as rubber mounts, pads, or springs; barriers to block the transmission of sound; damping to reduce noise; and absorption by the use of resonators and open-celled porous materials.

To determine the cost of engineering controls, MSHA began by contacting manufacturers of noise control materials and equipment, equipment manufacturers, and the makers of acoustical materials. From the information provided by these companies, MSHA compiled a range of costs of various engineering controls. The results are summarized in Table IV-7.

TABLE IV-7: The Range of Costs of Various Noise Engineering Controls

Cost Range	Engineering Control
$150 - $700	Exhaust muffler (cost depends on size and type of equipment)
$600 - $700	Absorptive acoustical material, composite acoustical material, floormat acoustical material (for existing cabs)
$5,000 - $20,000	Add on cab with acoustical treatment
$10 - $85/sq ft	Chute lining material
$15 - $85/sq ft	Hopper lining material
$30 - $80/sq ft	Screen deck material
$840 - $1,200	Remote system (4 cameras, TV, bearing sensors, bin level indicators)
$1,870 - $2,440	Acoustical ceiling baffles
$3,900 - $5,900	Flexible acoustical material (for machine enclosure)
$26,000 - $35,000	Continuous miner - auger type (acoustically-treated cutting heads and treated pan line)
$66,000 - $75,000	Continuous miner - drum type (acoustically-treated pan line; dust scrubber and silencer system)
$1,000 - $6,000	Auxiliary ventilation fan (acoustically-treated vanes)
$2,500 - $9,000	Auxiliary ventilation fan (silencer system)
$1,000 - $2,000	Acoustical materials for roof bolter, haul truck, or scaler
$15,000 - $30,000	Radio remote control for longwall
$5,000 - $10,000	Umbilical remote control for longwall
$6,000 - $10,000	Acoustically-treated pan line for loading machine
$2,000 - $4,000	Acoustically-treated personnel compartment of man trip

MSHA then selected a likely combination of engineering controls for a typical mine in 10 categories of mine sizes (i.e., 1-4 miners, 5-9 miners, etc.) and calculated their cost using the data in Table IV-7. Next, MSHA used its 1997 preliminary count report of mines (excluding independent contractors) and its

sampling data to determine the number of mines above the PEL in each category. Finally, MSHA multiplied the number of mines (again, excluding independent contractors) in each size category by the average annualized cost of engineering controls.

In its preliminary RIA, MSHA encouraged the public to comment on its cost estimates. MSHA also conducted several public hearings in which the Agency solicited comments on its cost estimates. At the public hearings and in written comments, several mine operators provided estimates of the costs of engineering controls. This information was considered in the Agency's analysis.

One commenter stated that a small operator was given estimates of over $4,500 for controls to decrease exposures "by only a few dBA," and a prep plant operator was quoted a "price of over $100,000." The commenter did not provide information about what kinds of controls were being recommended; nor did the commenter offer any details about these estimates (e.g., size of plant, expected controls, cost per control, the expected dBA reduction, etc).

Another commenter stated that two blowers in a preparation plant had been enclosed in noise-insulated metal housings for a cost of $13,988 (in addition to $12,517 for cooling capacity) and that this measure was only able to achieve a noise reduction of 3 to 4 dBA. Another operator stated that a cab on a shuttle car

would cost $50,000. Other commenters stated that retrofitting rubber liners would cost hundreds of thousands of dollars for manpower and materials per plant and that a closed loop cooling water recovery system costs up to $25,000.

Another commenter stated that an acoustical cab on scalers, load/haul/dump equipment, and roofbolters costs $25,000 to $50,000 each; the commenter did not provide estimates for lower-priced engineering controls. Other commenters provided estimates of $25,455 for a Getman scaler cab, $14,000 for a bolter cab, $20,000 for a Joy undercutter cab or Jumbo Driller cab, and $50,000 for a Wagner LHD retrofit kit. They did not provide estimates for lower-priced engineering controls.

At the Denver hearing, a commenter stated that engineering controls will cost $100,000. MSHA requested more information from the individual; however, no additional data were submitted. Another commenter in Denver stated that the rule will drive mine operators out of business. MSHA requested data from the commenter to ascertain the reasoning for this statement, but no information was submitted.

One commenter questioned whether MSHA had considered shipping and lost production costs. MSHA has not included shipping costs but has included installation costs in its estimates. Shipping costs are variable and difficult to estimate; some controls may be purchased locally without

appreciable shipping costs. Overall, shipping costs will add only minimal costs, particularly when annualized. MSHA did not include lost production costs in its estimates, expecting that mine operators will use prudent management when scheduling the retrofitting activities so as to prevent or minimize production disruptions. MSHA believes that most mine operators will schedule the retrofitting during routine downtimes for maintenance. For larger mines, the mine operators have more flexibility and will most likely be able to rotate equipment for the purposes of retrofitting and to schedule it during routine downtimes.

Another commenter questioned whether MSHA had included maintenance costs that are incurred to maintain engineering controls and also had concerns about the inclusion of costs after the 10-year period during which one-time-only costs were amortized (annualized). MSHA included operating and maintenance costs in its proposed rule's RIA and in this final rule's REA. In addition, although compliance equipment costs are annualized over a 10 year period, this should not be construed to mean that these costs cease after the 10-year period is over. When the equipment wears out in 10 years, replacement equipment must be purchased to achieve compliance with the PEL.

Another commenter was concerned that engineering controls will result in a loss of equipment warranty or a loss of machine

efficiency. Many of the engineering controls——such as curtains, mufflers, and cabs——are purchased from the manufacturer of the equipment. Warranties are a by-product of the purchase. In addition, engineering controls can improve efficiency in some cases. For instance, one commenter stated that internal combustion engine mufflers can actually improve performance. This commenter further noted that damping causes no loss of performance, that a film-faced absorber can be extremely smooth in the air flow, and that the facing will have little effect on the performance.

The data presented in Table IV-7 and in the tables that follow represent substantial research on the part of MSHA to estimate as accurately as possible the costs of the various compliance measures being considered. MSHA takes this opportunity to thank the many members of the mining community who provided constructive and useful information to assist in the preparation of this final REA.

For the coal industry, the current coal rule has permitted hearing protectors to be substituted for feasible engineering and administrative controls. This will no longer be permitted under the final rule; therefore, the coal industry will experience a relatively higher expense for engineering controls. However, MSHA anticipates that these expenses will be partially offset by

the elimination of the existing requirements for mine operators to provide various records, certifications, and reports.

In addition, MSHA expects that, for the coal industry as a whole, the use of relatively inexpensive controls has not been exhausted in all cases. Under the current rule, MSHA estimates that the engineering controls used at coal mines have been limited to the use of mufflers or acoustical foam to retrofit approximately three machines, on average, at small mines and 11 machines, on average, at large mines.

Table IV-8 provides details about the possible combination of engineering controls that will be used by coal mines under the final rule. The table presents a set of engineering controls for a typical coal mine in each size category. Each coal mine will, of course, differ in the engineering controls that it uses. MSHA is providing a set of sample engineering controls in Table IV-8 only for the purpose of deriving an average cost. It should be emphasized that MSHA is not requiring a particular type of engineering control. Mine operators have the flexibility to select whatever controls they think appropriate based on their own unique operating conditions.

TABLE IV-8: Examples of Engineering Controls for Coal Mines

Size	Coal Mines: Examples of Engineering Controls
1-4 miners	retrofitting 1 to 3 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material (chute or hopper lining at processing plants); adding up to 2 mufflers to smaller equipment; an acoustically-treated roof bolter and treated vanes on auxiliary ventilation fan or a treated man trip
5-9 miners	retrofitting up to 3 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material (chute or hopper lining at processing plants); adding up to 3 mufflers to smaller equipment; up to 2 acoustically-treated roof bolters and treated vanes on auxiliary ventilation fan or a treated man trip
10-19 miners	retrofitting up to 3 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material (chute or hopper lining at processing plants); adding up to 4 mufflers on smaller to midsized equipment; up to 2 acoustically-treated roof bolters and treated vanes on auxiliary ventilation fan or a treated man trip
20-34 miners	retrofitting up to 5 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 6 mufflers on smaller to midsized equipment; up to 2 acoustically-treated roof bolters and treated vanes on auxiliary ventilation fan; a treated man trip; a silencer system on an auxiliary ventilation fan (chute or hopper lining at processing plants)
35-49 miners	retrofitting up to 9 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 12 mufflers on smaller to midsized equipment; up to 2 acoustically-treated roof bolters and treated vanes on auxiliary ventilation fan; a treated man trip; a silencer system on an auxiliary ventilation fan (chute or hopper lining at processing plants)
50-99 miners	retrofitting up to 9 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 12 mufflers on smaller to midsized equipment; remote system; adding acoustical ceiling baffles; treated operator booth; up to 2 acoustically-treated roof bolters; 2 treated vanes on auxiliary ventilation fan; a treated man trip; a silencer system on an auxiliary ventilation fan (chute or hopper lining where applicable)
100-149 miners	retrofitting up to 7 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 8 mufflers (small to large equipment); remote system; adding acoustical ceiling baffles; treated operator booth; up to 2 acoustically-treated roof bolters; 2 treated vanes on auxiliary ventilation fan; a treated man trip; a silencer system on an auxiliary ventilation fan (chute or hopper lining where applicable)
150-249 miners	retrofitting up to 7 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 8 mufflers (small to large equipment); 3 remote systems; adding acoustical ceiling baffles; 2 treated operator booths; up to 2 acoustically-treated roof bolters; 2 treated vanes on auxiliary ventilation fan; a treated man trip; a silencer system on an auxiliary ventilation fan (chute or hopper lining, where applicable)

250-500 miners	retrofitting up to 10 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 10 mufflers (small to large equipment); 4 remote systems; adding acoustical ceiling baffles to 5 large units; 3 treated operator booths, up to 2 acoustically-treated roof bolters; 2 treated vanes on auxiliary ventilation fan; up to 3 treated man trips; up to 3 silencer systems on an auxiliary ventilation fan; up to 2 continuous miner auger type treated cutting heads and pan line; continuous miner drum type dust scrubber and silencer system (chute or hopper lining, where applicable)
500+ miners	retrofitting up to 15 machines with acoustical foam and barriers, absorptive, composite, and floormat acoustical material; adding up to 15 mufflers on small to large equipment; 3 remote system or treated pan line on loading machine; adding acoustical ceiling baffles; up to 5 treated operator booths, up to 5 acoustically-treated roof bolters; 2 treated vanes on auxiliary ventilation fan; up to 5 treated man trips; up to 5 silencer systems on an auxiliary ventilation fan; continuous miner auger type treated cutting heads and pan line; continuous miner drum type dust scrubber and silencer system (chute or hopper lining, where applicable)

Table IV-9 provides estimates of the annualized capital cost of engineering controls for coal mine operators (excluding independent operators) currently above the PEL. These estimates are based on a representative set of engineering controls, as described in Table IV-8, and the costs of those engineering controls, as indicated in Table IV-7. Because the type and amount of engineering controls needed are related to the size of the mine, MSHA performed this set of calculations for each mine-size category.

The Agency anticipates that mine operators will incur capital costs for engineering controls predominantly in the first year. In developing its cost estimates, MSHA annualized these capital costs to obtain a yearly cost which can be combined with the other annual and annualized costs of the final rule.

TABLE IV-9: Capital Cost of Engineering Costs for Coal Mines

Mine Size (miners)	# of Mines [a]	Capital Cost of Engineering Controls per Mine	Total Capital Cost of Engineering Controls	Annualized Capital Cost of Engineering Controls [b]
1-4	157	$ 5,458	$ 856,866	$ 121,675
5-9	87	$ 6,655	$ 578,979	$ 82,215
10-19	113	$ 7,394	$ 835,563	$ 118,650
20-34	111	$ 12,352	$ 1,371,127	$ 194,700
35-49	55	$ 21,655	$ 1,191,021	$ 169,125
50-99	57	$ 32,782	$ 1,868,556	$ 265,335
100-149	17	$ 40,035	$ 680,599	$ 96,645
150-249	15	$ 48,732	$ 730,986	$ 103,800
250-500	13	$ 184,155	$ 2,394,014	$ 339,950
500+	3	$ 307,782	$ 923,345	$ 131,115
All mines above PEL (> 90 dBA)	628	$ 667,000	$ 11,431,056	$ 1,623,210

[a] Number of coal mines currently with miners exposed to noise levels above TWA_8 of 90 dBA. Excludes independent contractors. (Source: MSHA's dual threshold survey.)

[b] Annualized capital cost of engineering controls = 14.2% of capital cost of engineering controls.

In addition to these annualized capital costs, MSHA has estimated the annual costs to operate and maintain the engineering controls to be 10% of the capital cost of the engineering controls. Table IV-10 summarizes the total cost of engineering controls.

TABLE IV-10: Total Cost of Engineering Controls for Coal Mines

Size	Total Capital Cost of Engineering Controls [a]	Annual Operating & Maintenance Costs [b]	Annualized Capital Cost of Engineering Controls [c]	Total Yearly Cost of Engineering Controls [d]
Small Mines	$ 2,271,408	$ 227,141	$ 322,540	$ 549,681
Large Mines	$ 9,159,648	$ 915,965	$ 1,300,670	$ 2,216,635
Total	$ 11,431,056	$ 1,143,106	$ 1,623,210	$ 2,766,316

[a] Source: Table IV-9.

[b] Annual operating & maintenance costs = 10% of total capital cost of engineering controls.

[c] Annualized cost = 14.2% of total capital cost.

[d] Total yearly cost of engineering controls = annualized capital cost + annual operating & maintenance costs.

For the metal/nonmetal mining industry, the final rule does not change the requirements to use engineering controls to achieve the PEL. Existing standards, §§ 56/57.5050(b), already require metal/nonmetal mines to use feasible engineering controls or administrative controls to achieve the 90 dBA PEL (using a 90 dBA threshold to determine noise exposure). MSHA, therefore, has estimated the incremental cost of engineering controls for metal/nonmetal mines as a result of this final rule to be zero. This should not be construed to mean that metal/nonmetal mines do not have to use engineering controls to comply with the PEL, but that satisfying the PEL at metal/nonmetal mines is not an additional requirement of this final rule.

The final rule also provides mine operators with the flexibility of using administrative controls to achieve compliance with the 90 dBA PEL. Administrative controls include job rotation of workers to reduce a miner's daily exposure.

If any administrative controls are used, the final rule requires that the mine operator post the controls on the mine bulletin board and distribute copies to affected miners. This requirement will impose a one-time cost on mine operators that use administrative controls. MSHA estimates that small mine operators will need, on average, approximately 0.75 hours of supervisory time to write administrative controls and approve the final procedures (including a negligible amount of time to give instructions to a clerical) and 0.75 hours of clerical time to type, edit, and post the controls. For large mines, MSHA estimates that approximately 1.5 hours of supervisory time (including a negligible amount of time to give instructions to a clerical) and 0.75 hours of clerical time will be needed. For both large and small mines, making and distributing copies to miners will consume about 0.05 hours of clerical time per miner and also cost about $0.25 per miner in photocopying expense.

MSHA received several comments concerning the use and cost of administrative controls. One commenter stated that the cost calculated in the PRIA “seems more based on fantasy than reality...” MSHA believes that the commenter probably assumed

that all mines having exposures above the PEL would use administrative controls, because the commenter further stated "...particularly in view of the fact that the agency's own estimates predict that the rule will throw 77% of the industry out of compliance..." The final rule, however, only requires the use of all feasible engineering and administrative controls to reduce exposures.

MSHA acknowledged in the proposed rule's preamble and PRIA that some mines would not be able to use administrative controls. In the PRIA, MSHA noted that "5% of small metal/nonmetal mines, 30% of small coal mines, and 75% of large metal/nonmetal and coal mines" will have mining conditions compatible with the implementation of administrative controls.

Based on written comments as well as hearing testimony, MSHA has revised its estimates of how many mines will be able to use administrative controls. For the final rule, MSHA estimates that only 2.5% of small metal/nonmetal mines, 15% of small coal mines, and 35% of large metal/nonmetal and coal mines will have mining practices which are conducive to the use of administrative controls.

Table IV-11 provides MSHA's estimate of the total cost of administrative controls for both coal and metal/nonmetal mines under the final rule.

TABLE IV-11: Total Cost of Administrative Controls for Coal and Metal/Nonmetal Mines

Size	# of Mines[a]	Cost per Mine [b]	Total Cost Related to # of Mines	# of Miners [c]	Cost per Miner [d]	Total Cost Related to # of Miners	Total Cost	Total Annualized Cost [e]
Small Coal Mines	85	$ 45.00	$ 3,825	508	$ 1.10	$ 559	$ 4,384	$ 623
Large Coal Mines	102	$ 77.25	$ 7,905	7,417	$ 1.10	$ 8,159	$ 16,064	$ 2,281
Total	187		$ 11,730	7,925		$ 8,718	$ 20,448	$ 2,904
Small M/MN Mines	46	$ 39.75	$ 1,846	262	$ 1.10	$ 288	$ 2,134	$ 303
Large M/NM Mines	94	$ 66.75	$ 6,267	6,896	$ 1.10	$ 7,586	$ 13,853	$ 1,967
Total	140		$ 8,114	7,158		$ 7,873	$ 15,987	$ 2,270

[a] The number of affected mines = the number of mines with miners exposed to noise levels above TWA_8 of 90 dBA (from Table IV-6) multiplied by the percentage of mines able to use administrative controls. That percentage is 35% for large mines, 15% for small coal mines, and 2.5% for small metal/nonmetal mines.

[b] Cost per mine = $(h_c \times w_c) + (h_s \times w_s)$, where h_c and h_s are the hours of clerical and supervisory time required, respectively, and w_c and w_s are the clerical and supervisory hourly wages, respectively. $h_c = .75$, and $h_s = .75$ for small mines and 1.5 for large mines. $w_c = \$17$, and $w_s = \$43$ for coal mine supervisors and \$36 for metal/nonmetal mine supervisors.

[c] The number of affected miners = the number of miners exposed to noise levels above TWA_8 of 90 dBA (from Table IV-6) multiplied by the percentage of mines able to use administrative controls. That percentage is 35% for large mines, 15% for small coal mines, and 2.5% for small metal/nonmetal mines.

[d] The cost per miner = \$0.25 + (0.05 X \$17), where \$0.25 is the photocopying cost per miner, .05 is the hours of clerical time required, and \$17 is the hourly clerical wage rate.

[e] Total annualized cost = 0.142 X total cost, where 0.142 is the annualization factor.

Administrative control activities, such as job rotation, are now being used in the industry. MSHA is aware that the increased use of administrative controls to comply with the PEL under this final rule may result in additional costs for mine

Administrative control activities, such as job rotation, are now being used in the industry. MSHA is aware that the increased use of administrative controls to comply with the PEL under this final rule may result in additional costs for mine operators due to increased wages for certain jobs and costs associated with organizing the administrative actions. MSHA, however, anticipates that this increased cost will be minimal. The Agency is unable to quantify these increased costs due to the uncertainty of how mine operators will handle administrative controls and what those controls will be. MSHA had requested in the PRIA that the mining industry provide specific data that would aid the Agency in quantifying these costs, but no such data were submitted.

(b) *Dose Determination (Exposure Assessment)*

The final rule imposes the same dose determination requirements on coal mine operators and on metal/nonmetal mine operators, and many of the cost components associated with dose determination are virtually identical for these two mine sectors. Nevertheless, as shown later in this section, the total incremental cost of the dose determination requirements for coal mine operators under the final rule are significantly different from those for metal/nonmetal mine operators because

the dose determination requirements under the existing noise rule are so different.

While MSHA assumes that elements of dose determination costs will be similar for coal mine operators and for metal/nonmetal mine operators, MSHA expects that these cost elements will vary appreciably for large mines relative to small mines. For example, MSHA estimates that small mine operators will require an average of 2 hours to sample their workers, while large mine operators will require about 5 hours. The Agency anticipates that mine operators will sample sufficiently to minimize expenses and to determine noise doses accurately.

MSHA estimates that small mine operators will require the use of only one noise dosimeter but that large mine operators will require an additional dosimeter. MSHA further estimates that a noise dosimeter will cost about $1,490; this capital cost must be amortized over the 10-year life of the dosimeter in order to derive the annualized cost of the equipment. Some mine operators may rent a noise dosimeter to minimize up-front capital costs (although MSHA expects the annual rental costs to be similar in magnitude to the annualized cost of the dosimeter equipment). Small mines may be able to rent a dosimeter on a short-term basis because they have fewer workers to monitor and the monitoring could be accomplished in a brief period. Mine

operators also have the option to use contract services to monitor noise dose.

For all mines, MSHA estimates annual operating and maintenance costs to be the sum of calibration costs and 10% of the capital cost of the noise dosimeter(s). In the proposed rule's PRIA, the Agency estimated that noise dosimeters would be calibrated every other year at a cost of $150 per dosimeter (for an average of $75 a year of calibration costs per dosimeter).

At the public hearings and during the comment period, MSHA solicited comments on its dose determination estimates. In large part, the comments provided are broadly consistent with the cost estimates in the PRIA. For example, at the Denver hearings, one commenter stated that a dosimeter cost about $1,000, but the commenter did not know the costs associated with laboratory calibration. Other commenters provided cost estimates of $170, $209, $254, and $600 to calibrate a noise dosimeter. MSHA considers those estimates to be reasonable, with the exception of the $600 estimate. Based on an average of the first three estimates, MSHA estimates, for the final rule, that the cost of calibrating a dosimeter every other year will be about $211 (for an average of $105.50 a year of calibration costs per dosimeter).

Other commenters offered estimates for the overall cost of sampling workers, but it was not clear how these costs were derived. At the Denver hearing, MSHA suggested that commenters provide a "marked-up" RIA with estimates for the individual cost components; however, no one submitted comments in this form.

For the final rule, only mine operators, both coal and metal/nonmetal, with miners exposed to noise levels at or above the action level of a TWA_8 of 85 dBA will need to determine noise exposures. MSHA anticipates that mine operators will use some form of representative sampling within job classes or work areas to minimize expenses for dose determination. In addition, for large mines with more than one shift working on the same equipment, the mine operators may conduct monitoring on one shift to determine representative exposure levels for all shifts. All mines have the option of using their own monitoring records to determine exposures and to use MSHA's data from inspector sampling.

For coal mines, MSHA expects that the final rule will impose new or different dose determination requirements——relative to the existing rule——on all mine operators with miners exposed to noise levels at or above the action level of a TWA_8 of 85 dBA. MSHA calculated the incremental costs of the dose determination requirements of the final rule as the dosimeter and monitoring

costs borne by coal mines with noise exposures between a TWA_8 of 85 dBA and and one of 90 dBA.

In the proposed rule's RIA, MSHA assumed that coal mine operators would monitor worker noise exposure only once. Based on internal review by its technical staff, MSHA has modified this assumption for the final rule. MSHA now estimates that approximately half of the coal mine operators required to monitor noise exposures under the final rule will choose to do so annually, in order to keep apprised of changes in noise exposures so as to remain below the action level and to avoid exceeding the PEL. The other half will monitor noise exposures only once. The effect of this change of assumption is an increase in the cost of the final rule.

The final rule will also provide some savings to coal mine operators by eliminating certain dose determination requirements under the existing rule. Under the existing rule, coal mine operators required to survey miner noise exposures must do so twice a year. For this reason, annual operating and maintenance costs are expected to be much higher under the existing rule than under the final rule. MSHA estimates that annual operating and maintenance costs associated with dose determination under the existing rule are 25% of the capital cost of the noise dosimeters

and that the noise dosimeters are calibrated annually (rather than every other year under the final rule).

In the proposed rule's RIA, MSHA estimated that monitoring a miner under the existing rule requires only 0.25 hours each of a miner's and a supervisor's time. Based upon internal review by its technical staff, MSHA has concluded that this is insufficient time to check the calibration on the dosimeter, install the dosimeter on the miner, instruct the miner about monitoring procedures, check up on the miner several times during the day, remove the dosimeter, perform a dosimeter reading, and record the results. MSHA now estimates that the existing rule requires 0.5 hours each of a miner's and a supervisor's time. This modification will increase the savings attributed to the final rule.

In the proposed rule's RIA, MSHA assumed that all coal miners must be surveyed semi-annually under the existing rule. This assumption was criticized by a commenter who noted that, according to the existing rule, once coal miners have been sampled and the noise exposures samples are at or below the 90 dBA level, these miners do not have to be sampled further unless the job duties or noise levels have significantly changed. The Agency has reviewed this assumption and determined that the commenter is correct. Under the existing rule, coal mine

operations with noise exposures at or below 90 dBA are not required to conduct semiannual noise surveys and, in practice, are generally not doing so. For the final rule, MSHA assumes that only those coal mine operations with noise exposures above 90 dBA are required to perform semiannual sampling of their miners under the existing rule. Based on MSHA's dual threshold survey, only 23.6% of miners in small coal mines and 25.8% of

miners in large coal mines are therefore required to be sampled semiannually under the existing rule. This change of assumption will reduce the savings attributed to the final rule.

Table IV-12 provides MSHA's estimate of the cost of the dose determination requirements of the final rule on coal mine operators (excluding independent contractors, but including contractor workers). The total annual cost for coal mine operators in Table IV-12 equals the sum of the annualized capital cost, the annual operating and maintenance costs, and the (part annualized, part annual) labor cost. The total cost of the dose determination requirements of the final rule are net of the savings arising from the elimination of certain dose determination requirements under the existing rule. As shown in Table IV-12, those savings exceed the costs of the new dose determination requirements of the final rule: the net effect is to reduce coal mine operator costs by approximately $0.9 million annually.

TABLE IV-12: Total Cost of Dose Determination for Coal Mines

Size	# of Mines [a]	Capital Cost per Mine [b]	Total Capital Cost	Annualized Capital Cost [c]	Annual Operating & Maintenance Costs [d]	Annualized Labor Cost [e]	Total Annual Cost
Small Mines (cost)	1,076	$ 1,490	$ 1,602,990	$ 227,625	$ 273,799	$ 84,773	$ 586,197
Small Mines (existing cost)	357	$ 1,490	$ 531,328	$ 75,449	$ 208,074	$ 233,622	$ 517,145
Net Cost			$ 1,071,662	$ 152,176	$ 65,725	$ (148,849)	$ 69,052
Large Mines (cost)	826	$ 2,980	$ 2,462,523	$ 349,678	$ 420,612	$ 162,787	$ 933,077
Large Mines (existing cost)	271	$ 2,980	$ 807,282	$ 114,634	$ 316,140	$ 1,462,296	$ 1,893,071
Net Cost			$ 1,655,241	$ 235,044	$ 104,472	$ (1,299,510)	$ (959,993)
Total Net Costs for Small & Large Coal Mines			$ 2,726,903	$ 387,220	$ 170,197	$ (1,448,359)	$ (890,941)

[a] For the final rule, the number of coal mines with miners exposed to noise levels at or above TWA_8 of 85 dBA; for the existing rule, the number of coal mines with noise exposures above a TWA_8 of 90 dBA (from Table IV-5). The estimates exclude independent contractors.

[b] For both the existing and the final rule, the capital cost per mine = the cost of one dosimeter for small mines and the cost of two dosimeters for large mines, where the cost of a dosimeter = $1490.

[c] For both the existing and the final rule, the annualized capital cost = 0.142 X capital cost, where 0.142 is the annualization factor.

[d] For the final rule, annual operating and maintenance costs = (0.1 X k) + (m X d X $105.50), where k is the capital cost; m is the number of mines (excluding independent contractors) with miners exposed to noise levels at or above TWA_8 of 85 dBA; d is the number of dosimeters and d = 1 for small mines and d = 2 for large mines; and $105.50 is the annual calibration cost. For the existing rule, annual operating and maintenance costs = (0.25 X k) + (m X d X $211), where k again is capital cost; m is the number of affected miners; d again is the number of dosimeters and d = 1 for small mines and d = 2 for large mines; and $211 is the annual calibration cost.

[e] For the final rule, annualized labor cost = m X h X ($26 + $43) X (0.142 / 2 + 1 / 2), where m is the number of mines (excluding independent contractors) with miners exposed to noise levels at or above TWA_8 of 85 dBA; h is the number of hours required of each a miner and a supervisor and h = 2 for small mines and h = 5 for large mines; $26 and $43 are the hourly wage rates for a coal miner and a coal mine supervisor, respectively; 0.142 / 2 is the annualization rate for the one-time costs for half the affected mines; and 1 / 2 reflects that the costs occur annually for the other half of the affected mines. For the existing rule, labor cost (which is annual) = n X 0.5 X ($26 + $43) X 2, where n is the number of miners exposed to noise levels above a TWA_8 of 90 dBA (from Table IV-6); 0.5 is the number of hours required to sample a miner; and 2 refers to the number of times a year the miner must be sampled.

For metal/nonmetal mines, under the existing rule, mine operators must perform sufficient monitoring to determine if noise exposures exceed the 90 dBA PEL. For this reason, MSHA expects that all metal/nonmetal mines with noise exposures above a TWA_8 of 90 dBA presently own, or rent, a dosimeter and conduct noise monitoring. With this expectation, MSHA calculated the incremental costs of the dose determination requirements of the final rule as the dosimeter and monitoring costs borne by metal/nonmetal mines with noise exposures between a TWA_8 of 85 and one of 90 dBA.

As was done in the case of coal mine operators, MSHA now assumes that approximately half of the metal/nonmetal mine operators required to monitor noise exposures under the final rule will choose to do so annually, while the other half will do so only once. All other assumptions involving the dose determination costs for metal/nonmetal mine operators in the final rule are consistent with those provided in the proposed rule's RIA.

Table IV-13 provides the cost of the dose determination requirements of the final rule on metal/nonmetal mine operators (excluding independent contractors, but including contractor workers), which MSHA estimates to be approximately $3.1 million annually. As in the preceding table, the total annual cost equals the sum of the annualized capital cost, the annual

operating and maintenance costs, and the (part annualized, part annual) labor cost.

TABLE IV-13: Total Cost of Dose Determination for Metal/Nonmetal Mines

Size	# of Mines [a]	Capital Cost per Mine [b]	Total Capital Cost	Annualized Capital Cost [c]	Annual Operating & Maintenance Costs [d]	Annualized Labor Cost [e]	Total Annual Cost
Small Mines	4,570	$ 1,490	$ 6,809,312	$ 966,922	$ 1,163,067	$ 307,918	$ 2,437,907
Large Mines	782	$ 2,980	$ 2,331,427	$ 331,063	$ 398,220	$ 131,784	$ 861,067
Total	5,352		$ 9,140,739	$ 1,297,985	$ 1,561,287	$ 439,702	$ 3,298,974

[a] The number of metal/nonmetal mines with miners exposed to noise levels at or above TWA_8 of 85 dBA but not above TWA_8 of 90 dBA (from Table IV-5). The estimates exclude independent contractors.

[b] Capital cost per mine = the cost of one dosimeter for small mines and the cost of two dosimeters for large mines, where the cost of a dosimeter = $1490.

[c] Annualized capital cost = 0.142 X capital cost , where 0.142 is the annualization factor.

[d] Operating and maintenance costs = (0.1 X k) +(m X d X $105.50), where k is the total capital cost; m is the number of mines (excluding independent contractors) with miners exposed to noise levels at or above TWA_8 of 85 dBA; d is the number of dosimeters and d = 1 for small mines and d = 2 for large mines; and $105.50 is the annual calibration cost.

[e] Annualized labor cost = m X h X ($23 + $36) X (0.142 / 2 + 1/2), where m is the number of affected metal/nonmetal mines; h is the number of hours required of each a miner and a supervisor and h = 2 for small mines and h = 5 for large mines; $23 and $36 are the hourly wage rates for a MNM miner and a MNM mine supervisor, respectively; 0.142 / 2 is the annualization rate for the one-time cost for half the affected mines; and 1 / 2 reflects that the costs occur annually for the other half of the affected mines.

(c) *Notification*

The final rule will require mine operators to notify miners when their exposure levels equal or exceed the action level or exceed the PEL, dual hearing protection level, or ceiling level.

MSHA estimates that this notification requirement will impose the following costs on mine operators: an average of 0.1 hours each of supervisory time and clerical time per mine for a supervisor to give notification instructions to a clerical worker, 0.08 hours of clerical time spent per miner to prepare and distribute the notification, and $0.25 per miner for photocopying. MSHA anticipates that the notification costs will be incurred primarily during the first year after the final rule takes effect. For that reason, notification costs have been converted to annualized costs. The annualized notification costs are displayed in Table IV-14.

TABLE IV-14: Total Notification Cost

Size	Coal					Metal and Nonmetal				
	# of Miners[a]	Cost Related to # of Miners [b] (annualized)	Costs related to # of miner	Cost Related to # of Mines [d] (annualized)	Total Costs	# of Miners[a]	Cost Related to # of Miners [b] (annualized)	# of Mines[c]	Cost Related to # of Mines [d] (annualized)	Total Costs
Small Mines	10,215	$ 2,335	1,710	$ 1,457	$ 3,792	38,153	$ 8,722	6,776	$ 5,099	$ 13,822
Large Mines	64,646	$ 14,779	892	$ 760	$ 15,539	80,647	$ 18,438	1,098	$ 826	$ 19,264
Total	74,861	$ 17,115	2,602	$ 2,217	$ 19,331	118,800	$ 27,160	7,874	$ 5,926	$ 33,086

[a] Number of miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6).

[b] Cost for miners = n X ($0.25 + (0.08 X $17)) X 0.142, where n is the number of miners exposed to noise levels at or above the action level; $0.25 is the cost of photocopying; 0.08 is the number of clerical hours to prepare and distribute the notification; $17 is the hourly wage for a clerical worker; and 0.142 is the annualization rate.

[c] Number of mines in which a miner is exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6).

[d] Cost related to # of mines (annualized) = m X 0.1 X (w_s + $17) X 0.142, where m is the number of mines in which a miner is exposed to noise levels at or above the action level; 0.1 is the number of hours required for a supervisor to give notification instructions to a clerical worker; w_s is the hourly wage rate for a mine supervisor ($43 for coal mine supervisor and $36 for M/NM mine supervisor); $17 is the hourly wage for a clerical worker; and 0.142 is the annualization factor.

(d) *Miscellaneous Reports and Surveys*

The final rule will eliminate several recordkeeping provisions of the existing rule that pertain to coal mine operators. In particular, the final rule will remove coal mine operator requirements to conduct supplemental noise surveys; to develop a written hearing conservation program (HCP); and to prepare calibration reports, survey reports, and survey certifications. MSHA has determined that these requirements are not necessary for miners' safety and health and that to remove them will not reduce miner health protection. In addition, the requirement to monitor records for the semiannual noise survey under the existing rule are being replaced by the notification requirements of § 62.110(d) of the final rule

Under the existing rule, all coal mine operators must prepare monitoring records, survey certifications, survey reports, and calibration reports. In addition, under the existing rule, coal mine operators are required to conduct a supplemental noise survey if a miner's noise exposure exceeds the PEL and to develop a written HCP if MSHA issues a noise citation.

MSHA describes below the estimated savings to coal mine operators from the removal of each of these existing requirements.

(1) *Supplemental Noise Surveys*

Under the existing rule, coal mine operators are required to conduct a supplemental noise survey twice a year if a miner's noise exposure exceeds the 90 dBA PEL. Elimination of this requirement will reduce coal mine operator costs. These costs include, for each miner whose noise exposure exceeds the PEL, the time required of a supervisor and a miner to perform the noise monitoring. In the supplemental proposed rule's RIA, MSHA estimated that monitoring a miner under the existing rule requires only 0.25 hours each of a miner's and a supervisor's time. MSHA has reviewed this estimate and concluded that 0.25 hours is not adequate time to perform the noise monitoring. MSHA has revised its estimate to 0.5 hours each of a miner's and a supervisor's time.

In addition, each coal mine with miners exposed to noise levels above a TWA_8 of 90 dBA must file the supplemental survey. That cost includes approximately 0.1 hours for a supervisor to give instructions to a clerical worker about filing the supplemental survey; an additional 0.05 hours of the clerical worker's time to file the survey; and $0.40 for letter paper, envelope, and postage to mail the survey to MSHA.

The total cost savings to coal mine operators associated with the elimination of this supplemental noise survey requirement are displayed in Table IV-15.

TABLE IV-15: Savings to Coal Mine Operators from Elimination of Supplemental Noise Survey Requirements

Coal	# of Miners [a]	Cost Savings Related to # of Miners [b]	# of Mines [c]	Cost Savings Related to # of Mines [d]	Total Savings
Small Mines	3,386	$ 242,087	567	$ 6,800	$ 248,887
Large Mines	21,193	$ 1,533,292	292	$ 3,509	$ 1,536,800
Total	24,579	$ 1,775,379	859	$ 10,309	$ 1,785,688

[a] The number of coal miners exposed to noise levels above 90 dBA (from Table IV-6).

[b] Cost savings related to # of miners = n X ((0.5 X ($26 + $43)) + ((0.05 X $17) + $0.40)) X 2, where n is the number of coal miners exposed to noise levels above 90 dBA; 0.5 is the number of hours required of each a miner and a supervisor; $26 and $43 are the hourly wage rates for a coal miner and a coal mine supervisor, respectively; 0.05 is the number of hours required to file each miner's supplemental survey; $17 is the hourly wage rate for a clerical worker; $0.40 is the cost of letter paper, envelope, and postage; and 2 is the number of times the noise survey must be performed annually.

[c] The number of coal mines with miners exposed to noise levels above 90 dBA (from Table IV-6).

[d] Cost savings related to # of mines = m X 0.1 X ($43 + $17) X 2, where m is the number of mines with miners exposed to noise levels above 90 dBA; 0.1 is the number of hours required, per mine, for a supervisor to give instructions to a clerical worker about filing the supplemental survey; $43 and $17 are the hourly wage rates for a coal mine supervisor and a clerical worker, respectively; and 2 is the number of surveys that must be filed annually.

(2) *Requirement for a Written HCP after a Citation*

Under the existing rule, the coal mine operator is required to develop a written HCP if a noise citation is issued. Elimination of this requirement will reduce coal mine operator costs. MSHA estimates that these costs consist of 4 hours per noise citation for a coal mine supervisor to write the HCP and 2 hours per noise citation for a clerical worker to type and edit

the written HCP. Based on the actual number of noise citations issued in recent years, MSHA estimates that an average of 89 noise citations are issued to small coal mines annually and an average of 67 noise citations are issued to large coal mines annually.

The total cost savings associated with the elimination of this written HCP requirement are presented in Table IV-16.

TABLE IV-16: Savings to Coal Mine Operators from Elimination of Written HCP Requirements

Coal	Written HCPs per Year [a]	Total Supervisor Cost Savings [b]	Total Clerical Worker Cost Savings [c]	Total Savings
Small Mines	89	$ 15,308	$ 3,026	$ 18,334
Large Mines	67	$ 11,524	$ 2,278	$ 13,802
Total	156	$ 26,832	$ 5,304	$ 32,136

[a] Written HCPs per year = the average number of noise citations issued per year.

[b] Total supervisor cost savings = n X 4 X $43, where n is the average number of written HCPs annually; 4 is the number of supervisor hours required to write an HCP; and $43 is the hourly wage rate for a coal mine supervisor.

[c] Total clerical worker cost savings = n X 2 X $17, where n is the average number of written HCPs annually; 2 is the number of clerical worker hours required to type and edit the written HCP; and $17 is the hourly wage rate for a clerical worker.

(3) *Survey Reports and Certifications*

Under the existing rule, all coal mine operators are required semiannually to produce a survey report and to prepare a survey certification. Removal of these requirements will reduce coal mine operator costs. MSHA estimates that these costs

consist of 0.05 hours of a coal mine supervisor's time to prepare each survey report; an additional 0.05 hours of a coal mine supervisor's time to prepare each survey certification; and $0.40 for letter paper, envelope, and postage to mail each survey certification to MSHA.

The total cost savings associated with the elimination of the requirements to prepare a survey report and a survey certification are presented in Table IV-17.

TABLE IV-17: Savings to Coal Mine Operators from Elimination of Survey Report & Survey Certification Requirements

Coal	# of Mines [a]	Survey Report Cost Savings [b]	Survey Certification Cost Savings [c]	Total Savings
Small Mines	2,401	$ 10,325	$ 12,246	$ 22,572
Large Mines	1,133	$ 4,873	$ 5,780	$ 10,653
Total	3,535	$ 15,198	$ 18,026	$ 33,224

[a] The total number of coal mines (from Table IV-4).

[b] Survey report cost savings = m X 0.05 X $43 X 2, where m is the number of coal mines; 0.05 is the number of hours of supervisor time required to prepare a survey report; $43 is the hourly wage rate for a coal mine supervisor; and 2 is the number of survey reports required annually.

[c] Survey certification cost savings = m X ((0.05 X $43) + $0.40) x 2, where m is the number of mines; 0.05 is the number of hours of supervisor time required to prepare a survey certification; $43 is the hourly wage rate for a coal mine supervisor; $0.40 is the cost of letter paper, envelope, and postage; and 2 is the number of survey certifications required annually.

(4) *Calibration Reports*

Under the existing rule, all coal mine operators are required to prepare an annual calibration report. Removal of

this requirement will reduce coal mine operator costs. MSHA estimates that the cost is 0.25 hours of a coal mine supervisor's time to prepare each calibration report.

The total cost savings associated with the elimination of the calibration report requirements are presented in Table IV-18.

TABLE IV-18: Savings to Coal Mine Operators from Elimination of Calibration Report Requirements

Coal	# of Mines [a]	Total Savings[b]
Small Mines	2,401	$ 25,813
Large Mines	1,133	$ 12,182
Total	3,535	$ 37,996

[a] The total number of coal mines (from Table IV-4).

[b] Total savings = m X 0.25 X $43, where m is the number of coal mines; 0.25 is the number of hours of supervisor time required to prepare a calibration report; and $43 is the hourly wage rate for a coal mine supervisor.

(5) *Noise Monitoring Record*

Under the existing rule, coal mine operators must record semiannually the noise exposure of all their miners. This requirement under the existing rule is being replaced by § 62.110(d) under the final rule. Removal of the existing provision to maintain a noise monitoring record will reduce coal mine operator costs. MSHA estimates this cost to be 0.1 hours of a supervisor's time to record each miner's semiannual noise monitoring.

The total cost savings associated with the elimination of the requirements to maintain a noise monitoring record are presented in Table IV-19.

TABLE IV-19: Savings to Coal Mine Operators from Elimination of Requirements to Maintain a Monitoring Record

Coal	# of Miners [a]	Total Savings[b]
Small Mines	14,347	$ 123,382
Large Mines	82,142	$ 706,423
Total	96,489	$ 829,805

[a] The total number of coal miners (from Table IV-4).

[b] Total savings = n X 0.1 X $43 X 2, where n is the number of coal miners; 0.1 is the number of hours of supervisor time required to record each monitoring result; $43 is the hourly wage rate for a coal mine supervisor; and 2 is the number of monitoring records required annually.

(6) *Summary of Savings from Elimination of Miscellaneous Reports and Surveys*

Under the existing rule, coal mine operators are required to conduct supplemental noise surveys; to develop a written hearing conservation program; to prepare calibration reports, survey reports, and survey certifications; and to maintain noise monitoring records. MSHA estimates that elimination of these requirements and the replacement of the record monitoring requirment will save coal mine operators approximately $2.4

million annually. Table IV-20 summarizes the source of these cost savings.

TABLE IV-20: Savings to Coal Mine Operators from Elimination of Miscellaneous Reports & Surveys*

Existing Requirements	Cost Savings for Small Mines	Cost Savings for Large Mines	Total Savings
Supplemental Noise Surveys	$ 248,887	$ 1,536,800	$ 1,785,688
Written HCP after a Citation	$ 18,334	$ 13,802	$ 32,136
Survey Reports & Certifications	$ 22,572	$ 10,653	$ 33,224
Calibration Reports	$ 25,813	$ 12,182	$ 37,996
Noise Monitoring Records	$ 123,382	$ 706,423	$ 829,805
Total	$ 438,989	$ 2,279,861	$ 2,718,849

* Source: Table IV-15; Table IV-16; Table IV-17; Table IV-18; and Table IV-19.

Two commenters questioned MSHA's estimates of the paperwork burden reduction of the proposed noise rule. These commenters noted that the February 1984 Program Information Bulletin 84-1C "eliminated virtually all paperwork requirements for operators" and that the "paperwork involves one letter and two 32 cent stamps per year per coal operator."

The February 1984 Program Information Bulletin (PIB) 84-1 C eliminated the requirement for the completion and submission to MSHA of a Coal Mine Noise Data Report Form when operator noise

exposure surveys are found to be within compliance. The PIB retained the submission requirement of a written and signed statement (certification) that the required surveys were made and that the surveys showed compliance. The PIB did not drop the requirement to conduct noise surveys, nor exclude the requirement to conduct and submit supplemental noise surveys for exposures above the PEL, nor eliminate the requirements to produce a calibration report and to retain a noise monitoring record for all coal miners.

In addition, the commenters failed to mention that there are labor and equipment costs associated with performing the supplemental surveys, completing survey reports and certifications, preparing calibration reports, and maintaining a noise monitoring record for all coal miners. Under the Paperwork Reduction Act of 1995 (PRA 95), all activities related to the generation of a paperwork item must be considered when calculating the costs and burden of paperwork tasks. For these reasons, MSHA's estimates are consistent with the requirements of PRA 95. The paperwork burden associated with the final rule is calculated and discussed in Chapter VII of this REA.

(e) Observation of Monitoring

Under the final rule, both coal and metal/nonmetal mine operators must perform noise monitoring if miners are exposed to

noise levels at or above the action level of TWA_8 of 85 dBA. The final rule also imposes certain requirements on mine operators concerning the observation of noise monitoring. These observation of monitoring requirements are examined below.

(1) *Permission of miners and miners' representatives to observe noise monitoring*

The final rule requires a mine operator to permit miners and miners' representatives to observe the operator's monitoring to determine miner noise exposure. MSHA anticipates that off-duty miners and miner's representatives in approximately 25 percent of the mines performing noise monitoring will exercise their right to observe these activities. For the remaining 75 percent of the mines, MSHA expects that miners and miners' representatives will not exercise their right to observe this monitoring.

MSHA expects that mine operators will perform exposure evaluations sufficient to determine the noise doses of miners. The scope of noise monitoring observation could include activities such as calibrating equipment, placing equipment, actual sampling, and recording results. MSHA estimates that the average time spent annually observing monitoring will be about 2 hours at small mines and about 5 hours at large mines. Note that these time estimates are being provided in annual terms solely for the purpose of this cost analysis; they are not

intended to represent the frequency with which noise sampling will have to be performed at a particular mine site to establish an effective system of monitoring.

In the supplemental proposed rule's RIA for observation of monitoring, MSHA assumed that the observation of monitoring by off-duty miners or miners' representatives imposed a cost on mine operators in the form of lost production. The Agency has reviewed that assumption and concluded that the observation of monitoring by off-duty miners and miners' representatives will not impose a cost on mine operators. If the miners or miners' representatives were not on duty prior to the observation of monitoring, then there is clearly no lost production. For the final rule, therefore, MSHA has concluded that there is no cost to the mine operator associated with a miner's or mine representative's off-duty observation of monitoring.

MSHA believes, however, that there is a cost associated with the observation of monitoring even though miners and miners' representatives receive no compensation from the mine operator for performing this task. That cost is in the form of the opportunity cost of the time spent by miners and mine representatives observing the noise monitoring (where, here, the opportunity cost refers to the productive activity the miners and mine representatives could otherwise be engaged in). MSHA

estimates the opportunity cost to be wage rate for those observing.

Table IV-21 provides MSHA's estimate of the cost borne by parties other than mine operators (including off-duty miners, miners' representatives, and other volunteer observers) resulting from observation of the mine operator's noise monitoring activities.

TABLE IV-21: Annual Cost of Requirement Permitting Observation of Noise Monitoring*

Size	# of Coal Mines [a]	Total Cost as a Function of the # of Coal Mines [b]	# of M/NM Mines [a]	Total Cost as a Function of the # of M/NM Mines [b]	Total Cost as a Function of the # of All Mines
Small Mines	1,710	$ 22,226	6,776	$ 77,919	$ 100,145
Large Mines	892	$ 28,986	1,098	$ 31,569	$ 60,555
Total	2,602	$ 51,212	7,874	$ 109,488	$ 160,700

* These costs are not borne by mine operators, but by other parties such as miner representatives, off-duty miners, or other volunteer observers.

[a] Number of mines with miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6).

[b] Total cost as a function of the # of coal or M/NM mines = m X 25% X h X w_m, where m is the number of mines with miners exposed to noise levels at or above the action level; 25% is the percentage of mines in which miners or miners' representatives will observe noise monitoring; h is the number of hours required for observation of monitoring and h=2 for small mines and h=5 for large mines; and w_m is the hourly wage rate for a miner and w_m=$26 for a coal miner. For metal/nonmetal mines, the equation for the total cost is the same, but w_m=$23.

(2) *Notification of miners and miners' representatives of noise monitoring*

Mine operators are also required under the final rule to notify miners and miners' representatives of plans to conduct

noise monitoring so that they will have the opportunity to exercise their right to observe. For purposes of this cost analysis, MSHA assumes that 45 percent of those mine operators who plan to conduct noise monitoring will inform miners and miners' representatives orally (for example, during a safety meeting); 35 percent of those mine operators will inform miners by posting a notice; and 20 percent of those mine operators will inform miners by distributing a written notice to each miner to be monitored. These estimates do not address other effective means of notifying miners and their representatives.

(3) *Oral Notification*

MSHA expects that the mine operators who notify miners and miners' representatives orally of planned operator noise monitoring activities will do so once a year. MSHA estimates that it will take a supervisor about 2 minutes (0.033 hours) to notify miners orally during a safety meeting. MSHA anticipates that miners will receive the oral notification of noise monitoring during regularly-held safety meetings. Therefore, the oral notification is not expected to impose any additional time requirements on miners. Table IV-22 provides MSHA's estimate of the cost of oral notification of noise monitoring.

TABLE IV-22: Cost to Mine Operators to Provide Oral Notification of Noise Monitoring

Size	# of Mines [a]	Cost per Mine[b]	Total Cost
Small Coal Mines	769	$ 1.42	$ 1,092
Large Coal Mines	401	$ 1.42	$ 570
Small M/NM Mines	3,049	$ 1.19	$ 3,622
Large M/NM Mines	494	$ 1.19	$ 587
Total	4,714		$ 5,870

[a] The number of mines = 45% X m, where 45% is the percentage of mines that notify miners orally and m is the number of mines with miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[b] Mine costs = 45% X m X 0.033 X w_s, where (45% X m) is the number of mines that notify miners orally; 0.033 is the number of hours required to notify a miner orally; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

(4) *Written Notices*

MSHA anticipates that the mine operators who notify miners and miners' representatives by written notice will do so once a year. MSHA estimates that it will take 0.1 hours per mine for a supervisor to provide instructions to a clerical worker about the preparation of the written notice, 0.08 hours per miner for a clerical worker to prepare and distribute the written notice; and $0.25 per miner for photocopying the written notice. Table IV-23 displays MSHA's estimate of the cost to provide written notice of noise monitoring.

TABLE IV-23: Cost to Mine Operators to Provide Written Notice of Noise Monitoring

Size	# of Miners [a]	Costs Related to # of Miners [b]	# of Mines [c]	Costs Related to # of Mines [d]	Total Cost
Small Coal Mines	2,043	$ 3,289	342	$ 2,052	$ 5,341
Large Coal Mines	12,929	$ 20,816	178	$ 1,070	$ 21,886
Small M/NM Mines	7,631	$ 12,285	1,355	$ 7,182	$ 19,467
Large M/NM Mines	16,129	$ 25,968	220	$ 1,164	$ 27,132
Total	38,732	$ 62,359	2,095	$ 11,468	$ 73,827

[a] The number of miners = 20% X n, where 20% is the percentage of miners receiving written notice of noise monitoring and n is the number of miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[b] Miner costs = 20% X n X ((0.08 X $17) + $0.25), where (20% X n) is the number of miners receiving written notice; 0.08 is the time needed for a clerical worker to prepare and distribute a written notice; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner of photocopying the written notice.

[c] The number of mines = 20% X m, where 20% is the percentage of mines that notify miners by written notice and m is the number of mines exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[d] Mine costs = 20% X m X 0.1 X (w_s + $17), where (20% X m) is the number of mines that notify miners by written notice; 0.1 is the number of hours needed for a mine supervisor to give instructions to a clerical worker; w_s is the hourly wage rate for a mine supervisor and w_s = $43 for a coal mine supervisor and w_s = $36 for a metal/nonmetal mine supervisor; and $17 is the hourly wage rate for a clerical worker.

(5) *Posted Notices*

As previously noted, MSHA assumes that 35 percent of those mine operators who plan to conduct noise monitoring will inform miners and miners' representatives by posting a notice. MSHA estimates that a supervisor will require 0.1 hours to instruct a clerical worker about preparing and posting notices; that a clerical worker will require 0.08 hours to prepare and post each

notice; that each notice with cost $0.25 for photocopying; and that, on average, a small mine will post 3 notices and a large mine will post 6 notices throughout the mine property. The resulting cost of providing posted notices is provided in Table IV-24.

TABLE IV-24: Cost to Mine Operators to Provide Posted Notices of Noise Monitoring

Size	# of Mines [a]	Cost per Mine[b]	Total Cost
Small Coal Mines	598	$ 10.83	$ 6,481
Large Coal Mines	312	$ 15.66	$ 4,888
Small M/NM Mines	2,371	$ 10.13	$ 24,023
Large M/NM Mines	384	$ 14.96	$ 5,749
Total	3,666		$ 41,141

[a] The number of mines = 35% X m, where 35% is the percentage of mines that notify miners by posted notice and m is the number of mines with miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[b] Cost per Mine = 35% X m X ((0.1 X (w_s + $17)) + (p X ((0.08 X $17) + $0.25)), where (35% X m) is the number of mines that notify miners by posted notice; 0.1 is the number of hours needed for a mine supervisor to give instructions to a clerical worker; w_s is the hourly wage rate for a mine supervisor and w_s = $43 for a coal mine supervisor and w_s = $36 for a metal/nonmetal mine supervisor; $17 is the hourly wage rate for a clerical worker; p is the number of posted notices per mine and p=3 for a small mine and p=6 for a large mine; 0.08 is the number of hours needed for a clerical worker to prepare and post a notice; and $0.25 is the photocopying expense per notice.

(6) *Summary of Costs Related to Observation of Monitoring*

Table IV-25 summarizes the cost to mine operators of requirements under the final rule associated with the observation of monitoring. These requirements include permitting miners and miners' representatives to observe noise monitoring and notifying

miners and miners’ representatives of plans to conduct noise monitoring.

TABLE IV-25: Summary of Costs to Mine Operators and to Other Parties of Requirements Related to Observation of Monitoring*

Methods of Notification	Coal		Metal/Nonmetal		Total Cost for All Mines	Total Cost for Other Parties	Total Cost
	Small Mines	Large Mines	Small Mines	Large Mines			
Observation	$ -	$ -	$ -	$ -	$ -	$ 160,700	$ 160,700
Oral Notices	$ 1,092	$ 570	$ 3,622	$ 587	$ 5,870	0	$ 5,870
Written Notices	$ 5,341	$ 21,886	$ 19,467	$ 27,132	$ 73,827	0	$ 73,827
Posted Notices	$ 6,481	$ 4,888	$ 24,023	$ 5,749	$ 41,141	0	$ 41,141
Total	$ 12,913	$ 27,344	$ 47,112	$ 33,469	$ 120,838	$ 160,700	$ 281,538

* Source: Table IV-21; Table IV-22; Table IV-23; and Table IV-24.

MSHA received several comments on the supplemental proposed rule concerning observation of monitoring; in addition, several individuals testified at the public hearing.

One commenter questioned the Agency's estimate of 5 hours for a large mine. The commenter believed that, for a mine which employed 1,500 workers, 12,000 hours (that is, an eight-hour workday for 1500 miners) would be spent on noise monitoring. First of all, miners will, for the most part, be productively engaged in mine production activities while being monitored. MSHA expects that production time lost per miner for noise monitoring will be only a fraction of an hour. Second, under the final rule, mine operators can determine miners' exposure levels in a number of ways. These include the use of existing monitoring records, the review of MSHA sampling records, or the use of representative sampling. Because mine operators have various mechanisms by which to determine a miner's noise dose, they are not required to monitor each employee. MSHA, therefore, believes that an average of 2 hours per small mine and 5 hours per large mine annually are reasonable estimates of the time needed to observe operator monitoring.

One commenter questioned the number of mines MSHA estimated would perform noise monitoring. The proposed noise rule's RIA was prepared using the most recent, currently-available mine counts when it was published. Since then, MSHA has updated its

calculations with preliminary 1997 year-end data.[33] Recall, also, that only mines with exposure levels at or above a TWA_8 of 85 dBA, using an 80 dBA threshold level, will need to do any monitoring to determine noise compliance levels. Mine operators, particularly coal mine operators who currently perform biannual noise surveys of their employees, should know generally the exposure levels of their employees.

At the public hearing, one commenter expressed concern that the cost estimates for notification of noise monitoring do not accurately reflect a scenario in which the mine operator cannot locate the miner or miner's representative on the first attempt. Several other commenters testified that they considered MSHA's time estimates and photocopy cost estimates——those associated with the notification of miners and miners' representatives about noise monitoring——to be high. In particular, they believed that the time required for a supervisor to give instructions to a secretary was excessive, and they verbally demonstrated their point. Further, they asserted that the length of time required to perform typing and posting were too high.

Other commenters challenged the length of time needed for observation and the total estimated annual information collection burden. However, they did not provide data to support their statements.

MSHA appreciates the interest and comments expressed by all commenters and all persons providing testimony at hearings. The Agency has considered all comments and has revised its estimates in response to the comments, where appropriate.

(f) *Summary of Sections 110 through 150*

Table IV-26 summarizes MSHA's estimates of the costs mine operators will incur to comply with §§ 62.110 - 62.150 of the final rule. These costs include the offsetting savings associated with the elimination of various existing requirements.

TABLE IV-26: Summary of Costs to Mine Operators of Requirements in Sections 110 through 150 of the Final Rule*

Requirement/ Provision	Coal	M/NM	Total Annual Costs
Engineering Controls	$ 2,766,316	$ -	$ 2,766,316
Administrative Controls	$ 2,904	$ 2,270	$ 5,174
Monitoring/Dose Determination	$ (890,941)	$ 3,298,974	$ 2,408,033
Notification	$ 19,331	$ 33,086	$ 52,417
Miscellaneous Reports & Surveys	$ (2,718,849)	$ -	$ (2,718,849)
Observation of Monitoring	$ 40,257	$ 80,581	$ 120,838
Total	$ (780,983)	$ 3,414,911	$ 2,633,929

* Source: Table IV-10; Table IV-11; Table IV-12; Table IV-13; Table IV-14; Table IV-20; and Table IV-25.

2. § 62.160 Hearing Protectors

The final rule requires hearing protectors to be provided to miners who are exposed to noise at or above the action level. Miners exposed at or above the action level are required to wear hearing protectors if they have experienced a standard threshold shift (STS) or if more than 6 months will elapse before their baseline audiograms can be obtained. When miners' noise exposure exceeds the PEL, the miners are required to wear a hearing protector until engineering and administrative controls have been implemented or if the miners' exposure continues to exceed the PEL despite the use of all feasible engineering and administrative controls. Dual hearing protection is required for miners when exposure exceeds 105 dBA during any workshift. Mine operators also must permit miners to select hearing protectors and then ensure that they are fitted correctly.

To calculate the incremental cost of providing hearing protectors under the final rule, MSHA took into account the number of miners already using hearing protectors. Some miners are currently covered by a voluntary hearing conservation program (HCP), which includes the use of hearing protectors. MSHA estimates that 5% of small mines and 20% of large mines currently have an HCP. Even in mines without an HCP, hearing protectors are used extensively, particularly in coal mines. MSHA estimates that 90% of small coal mines and 99% of large coal mines without

an HCP currently provide hearing protectors. For metal/nonmetal mines, MSHA estimates that 60% of small mines and 95% of large mines without an HCP currently provide hearing protectors. The requirement to provide hearing protectors under the final rule will impose costs only on those mine operators that do not currently provide hearing protectors and that expose miners to noise levels at or above the action level. Table IV-27 provides MSHA's estimate of the number of miners who must be provided hearing protectors as a result of the final rule.

TABLE IV-27: The Number of Miners not Currently Using Hearing Protectors Who Are Required to Use Hearing Protectors Under the Final Rule

Type	Coal		Metal & Nonmetal	
	Small	Large	Small	Large
# of miners ≥ 85 dBA [a]	10,215	64,646	38,153	80,647
% Already Participating in HCP	5%	20%	5%	20%
% Already Using Hearing Protectors	90%	99%	60%	95%
Incremental # of Miners Using Hearing Protectors [b]	970	517	14,498	3,226

[a] The number of miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA who have experienced a STS or for whom more than six months has elapsed before a baseline audiogram can be obtained (from Table IV-6).

[b] Incremental # if miners using hearing protectors = n X (1 - p) X (1 - u), where n is the number of miners exposed at or above the action level; p is the percentage of miners currently participating in an HCP; and u is the percentage of miners not in a HCP but already using a hearing protector.

Based on data the Agency collected concerning the utilization of hearing protectors in mines, MSHA estimates that mine operators will provide, to miners that require them, four types of hearing protectors in the following proportions: special muffs with adjustable volume control, 35%; disposable plugs, 20%; reusable plugs, 10%; and regular hearing muffs, 35%. MSHA obtained the following cost estimates for a year's supply of hearing protectors for one miner: specialized muffs, $37.36; a box of disposable plugs, $38.93; reusable plugs, $31.80; and regular hearing muffs, $17.00. The cost for hearing protection per miner, approximately $30, is a weighted average of the cost for each type of hearing protector, as calculated in Table IV-28.

TABLE IV-28: Average Costs of Hearing Protectors*

Type	Price	% of Usage	Weighted Price
Special Muffs	$ 37.36	35%	$ 13.08
Disposable Plugs	$ 38.93	20%	$ 7.79
Reusable Plugs	$ 31.80	10%	$ 3.18
Regular Muffs	$ 17.00	35%	$ 5.95
Average Cost of Hearing Protectors			$ 29.99

*Source: Data collected by MSHA.

The annual cost to mine operators for providing hearing protectors to comply with the final rule is simply the product of (1) the number of miners not currently wearing hearing protectors

who must be provided hearing protectors under the final rule (from Table IV-27) and (2) the average cost of hearing protectors (from Table IV-28). The calculation of this annual cost is provided in Table IV-29.

TABLE IV-29: Annual Cost to Mine Operators of Providing Hearing Protectors

Type	Coal						Total Cost
	Small			Large			
	# of Miners[a]	Cost per Miner [b]	Cost for Small Mines	# of Miners[a]	Cost per Miner [b]	Cost for Large Mines	
Annual Cost of Providing Hearing Protectors	970	$ 29.99	$ 29,105	517	$ 29.99	$ 15,511	$ 44,616
Type	Metal/Nonmetal						Total Cost
	Small			Large			
	# of Miners[a]	Cost per Miner [b]	Cost for Small Mines	# of Miners[a]	Cost per Miner [b]	Cost for Large Mines	
Annual Cost of Providing Hearing Protectors	14,498	$ 29.99	$ 434,823	3,226	$ 29.99	$ 96,751	$ 531,574

[a] Source: Table IV-27.

[b] Source: Table IV-28.

MSHA estimates that the selection and fitting of a hearing protector will take approximately 0.25 hours per miner. The resulting cost is presented in Table IV-30.

TABLE IV-30: Annual Cost to Mine Operators of Having Miners Select & be Fitted with HPDs

Type	Coal						Total Cost
	Small			Large			
	# of Miners[a]	Cost per Miner [b]	Cost Related to # of Small Mines	# of Miners[a]	Cost per Miner [b]	Cost Related to # of Large Mines	
Annual Cost of Selecting & Fitting HPDs	970	$ 6.50	$ 6,308	517	$ 6.50	$ 3,362	$ 9,669
Type	Metal/Nonmetal						
	Small			Large			Total Cost
	# of Miners[a]	Cost per Miner [b]	Cost Related to # of Small Mines	# of Miners[a]	Cost per Miner [b]	Cost Related to # of Large Mines	
Annual Cost of Selecting & Fitting HPDs [a]	14,498	$ 5.75	$ 83,363	3,226	$ 5.75	$ 18,549	$ 101,912

[a] Source: Table IV-27.

[b] The annual cost of selecting and fitting an HPD = n X 0.25 X w_m, where m is the incremental number of miners wearing an HPD (from Table IV-30); 0.25 is the number of hours per miner needed to choose and be fitted with an HPD; and w_m is the hourly wage rate for a miner and w_m=$26 for a coal miner and w_m=$23 for a metal/nonmetal miner.

By policy under the existing rule, MSHA already requires any metal/nonmetal miners exposed to noise levels exceeding 105 dBA during any workshift to use dual hearing protection. MSHA expects that, under the final rule, the number of coal miners exposed to noise levels exceeding the dual hearing protection level of 105 dBA, after the application of feasible engineering and administrative controls, will be negligible. Therefore, no

costs have been estimated for this requirement under the final rule.

The total cost for hearing protection attributable to § 62.160 of the final rule is summarized in Table IV-31.

TABLE IV-31: Summary of Annual Cost to Mine Operators of Requirements Under § 62.160 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small Mines	Large Mines	Small Mines	Large Mines	
Provide HPD	$ 29,105	$ 15,511	$ 434,823	$ 96,751	$ 576,190
Select/Fit	$ 6,308	$ 3,362	$ 83,363	$ 18,549	$ 111,581
Total	$ 35,412	$ 18,872	$ 518,186	$ 115,300	$ 687,771

*Source: Table IV-29 and Table IV-30.

3. § 62.170 Audiometric Testing Program

Under §§ 62.120 and 62.150 of the final rule, all miners whose noise exposure equals or exceeds the action level must be enrolled in a hearing conservation program (HCP). One of the requirements of an HCP is that enrolled miners be offered an audiometric test to provide a valid baseline audiogram. The audiometric test must be offered within 6 months of the miner's being enrolled in an HCP, with the exception that when mobile test vans are used, the mine operator has 12 months from the miner's date of enrollment in an HCP to offer the miner audiometric testing. An existing audiogram may be used to

provide a valid baseline audiogram if it meets the audiometric testing requirements of § 62.171 of this part.

An annual audiogram must be offered each year that a miner remains in the HCP. The mine operator is required to notify the miner that audiometric testing is being offered and that the miner should avoid high levels of noise exposure for 14 hours prior to taking an audiometric test. In addition, the mine operator must not expose the miner to workplace noise for the 14-hour quiet period before the audiometric test. The final rule, however, permits miners to wear hearing protectors as a substitute for the quiet period.

Although mine operators must offer audiometric testing to miners whose noise exposure equals or exceeds the action level under the final rule, testing is voluntary on the part of the miner. MSHA anticipates that all eligible miners will have an audiometric examination in the first year after the final rule becomes effective. However, based on its experience and comments received, the Agency expects that, in succeeding years, most eligible miners will forgo the opportunity to take an audiometric exam. MSHA estimates that only an average of 15% of eligible miners will choose to have an audiometric examination in subsequent years.

MSHA relied on exposure data from its 1995 dual threshold survey to estimate the number of miners who have exposures at or

above the action level and above the PEL. MSHA adjusted these estimates to account for the miners currently receiving audiometric testing either under the voluntary programs of their employers or under the current coal rule. In its preliminary RIA and in this final REA, MSHA estimates that 5% of small mines and 20% of large mines at or above a TWA_8 of 85 dBA currently provide audiometric tests as part of their voluntary HCPs. In addition, a small number of coal miners receive audiometric testing by their employers to comply with the requirements for mines which have noise exposures exceeding the PEL under the existing rule (§§ 70.510(b)(2)(iii) and 71.805(b)(2)(iii)). MSHA estimates that 2.7% of miners with noise exposures exceeding the existing PEL are currently being audiometrically tested.

Table IV-32 provides MSHA's estimate of the number of miners expected to have audiometric testing each year as a result of the final rule.

TABLE IV-32: Number of Miners Taking Audiometric Examinations as a Result of § 62.170 of the Final Rule

Type	Coal		Metal/Nonmetal	
	Small	Large	Small	Large
Number of Miners Eligible for Audiometric Testing [a]	10,215	64,646	38,153	80,647
Miners with Audiometric Testing Under Existing Rule[b]	91	572	N/A	N/A
Number of Miners Under Voluntary HCPs [c]	511	12,929	1,908	16,129
Miners Taking Audiometric Test First Year Final Rule [d]	9,613	51,145	36,245	64,518
Number of Miners Taking Audiometric Tests Subsequent Years Final Rule [e]	1,442	7,672	5,437	9,678

[a] Number of miners eligible for audiometric testing = the number of miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[b] Number of miners with audiometric testing under existing rule = 2.7% X n , where n is the number of coal miners exposed to noise levels above 90 dBA (from Table IV-43). The calculation is non-applicable (N/A) to metal/nonmetal mines.

[c] Number of miners under voluntary HCPs = 5% X n for small mines and 20% X n for large mines, where n is the number of miners exposed to noise levels at or above TWA_8 of 85 dBA.

[d] Number of miners taking audiometric testing first year final rule = a - b - c, where a is the total number of miners eligible for audiometric testing; b is the number taking audiometric testing under the existing rule; and c is the number taking audiometric testing under voluntary HCPs.

[e] Number of miners taking audiometric testing subsequent years final rule = 15% X d, where d is the number of miners taking audiometric testing first year final rule.

These estimates do not reflect the reduction in noise exposures due to the implementation of engineering and administrative controls in response to the final rule. These controls will reduce the number of miners above the PEL and possibly the number at or above the action level. However, due to the numerous uncertainties concerning the timing of the installation of these controls, MSHA did not reduce the number of eligible miners for audiometric testing. For this reason, the compliance costs for this section and for §§ 62.171, 62.172, 62.173, 62.174, and 62.175 are only representative approximations and may overestimate these costs.

For the preliminary RIA, MSHA estimated that an audiometric test would cost $30 and take one hour of the miner's time to perform. From information supplied during the public hearings and in written comments, MSHA was able to ascertain the accuracy of these estimates. At the Denver and Atlanta hearings, numerous individuals provided evidence of audiogram costs, which ranged from $10 to $25 per audiogram. In written comments, data on what mine operators are charged per audiogram ranged from $22 to $92.33. At the public hearings, mine operators provided estimates ranging from 0.25 hours to an hour for the time required for a miner to take an audiometric test. In written comments from mine operators, the time estimates ranged from 0.25 to 4.5 hours. Also at the public hearings, MSHA asked if mine

operators had to pay an annual contract fee or other costs if they used a contract audiogram provider. No mine operators responded that they did.

Based on the data MSHA collected for its preliminary RIA and the information provided at the public hearings and in written comments, MSHA has concluded that its estimates of $30 for the cost per audiometric examination and one hour for the time required for a miner to take an audiometric exam are representative averages for the mining industry.

One commenter questioned whether MSHA had considered the cost of lost production and the cost of wages for an employee to take an audiogram. In its preliminary RIA and in this final REA, MSHA has included the labor costs associated with taking an audiogram. Neither in its preliminary RIA nor in this final REA has MSHA included the cost of lost production for a miner to take an audiogram. MSHA believes that it is reasonable to assume that audiograms will be scheduled by the mine operator so as to minimize disruption to production activities. Furthermore, no mine operators who attended the public hearings and were questioned about their existing audiometric testing programs indicated that they experienced logistical problems with their voluntary audiometric testing programs. For these reasons, the Agency believes that inclusion of a cost of lost production would not be reflective of actual mining practices.

Table IV-33 provides MSHA's estimate of the cost of audiometric testing borne by mine operators the first year after the final rule becomes effective. The cost includes both the charge for the audiometric examination and the cost of the miner's time, valued at the miner's wage rate. Table IV-34 provides MSHA's estimates of the cost of audiometric testing over a 10-year period, from Year 1 to Year 10. These estimates are based on the assumption that only 15% of eligible miners will choose to have an audiometric examination in Years 2-10. The present value of the costs and the annualized cost in Table IV-34 were calculated using a discount rate of 7%.

TABLE IV- 33: The Cost to Mine Operators of Audiometric Testing as a Result of § 62.170 of the Final Rule (Year 1)

Size	Coal			Metal/Nonmetal			Total Costs for All Mines
	# of Miners [a]	Cost per Miner[b]	Total Cost	# of Miners [a]	Cost per Miner[b]	Total Cost	
Small	9,613	$ 56	$ 538,313	36,245	$ 53	$ 1,920,981	$ 2,459,294
Large	51,145	$ 56	$ 2,864,095	64,518	$ 53	$ 3,419,444	$ 6,283,539
Total	60,757		$ 3,402,408	100,763		$ 5,340,425	$ 8,742,833

[a] # of miners = the number of miners taking audiometric examinations the first year of the final rule (from Table IV-32).

[b] Cost per miner = $30 + (1 X w_m), where $30 is the average amount charged for an audiometric examination; 1 is the number of hours required for a miner to complete an audiometric examination; and w_m is the miner's hourly wage rate and w_m=$26 for a coal miner and w_m=$23 for a metal/nonmetal miner.

TABLE IV- 34: The Cost to Mine Operators of Audiometric Testing as a Result of § 62.170 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines by Year [a]	Total Cost for M/NM Mines by Year [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 3,402,408	$ 5,340,425	$ 8,742,833	0.9345794	$ 3,179,820	$ 4,991,052	$ 8,170,872
2	$ 510,361	$ 801,064	$ 1,311,425	0.8734387	$ 445,769	$ 699,680	$ 1,145,449
3	$ 510,361	$ 801,064	$ 1,311,425	0.8162979	$ 416,607	$ 653,907	$ 1,070,513
4	$ 510,361	$ 801,064	$ 1,311,425	0.7628952	$ 389,352	$ 611,128	$ 1,000,480
5	$ 510,361	$ 801,064	$ 1,311,425	0.7129862	$ 363,880	$ 571,147	$ 935,028
6	$ 510,361	$ 801,064	$ 1,311,425	0.6663422	$ 340,075	$ 533,783	$ 873,858
7	$ 510,361	$ 801,064	$ 1,311,425	0.6227497	$ 317,827	$ 498,862	$ 816,690
8	$ 510,361	$ 801,064	$ 1,311,425	0.5820091	$ 297,035	$ 466,226	$ 763,261
9	$ 510,361	$ 801,064	$ 1,311,425	0.5439337	$ 277,603	$ 435,726	$ 713,328
10	$ 510,361	$ 801,064	$ 1,311,425	0.5083493	$ 259,442	$ 407,220	$ 666,662
	Total			7.0235815	$ 6,287,411	$ 9,868,731	$ 16,156,141
	Annualized Cost [c]				$ 895,186	$ 1,405,085	$ 2,300,271

[a] Total cost for coal and M/NM mines for Year 1 = t (from Table IV-33). Total cost for coal and M/NM mines for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v/d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

Under the final rule, mine operators must annually notify all miners whose noise exposure equals or exceeds the action level about the availability of audiometric testing. MSHA anticipates that it will take an average of 0.1 hours per mine for a mine supervisor to give instructions to a clerical worker about the audiometric testing notification and to approve the final notification and that it will take an average of 0.08 hours per miner for a clerical worker to prepare and distribute a written notification. Photocopying expense for the written notification is estimated to be $0.25 per miner. Table IV-35 provides MSHA's estimate of the annual notification cost for audiometric testing.

TABLE IV-35: The Annual Cost to Mine Operators of Audiometric Testing Notification

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Miners	Total Costs
Small Coal Mines	9,613	$ 1.61	$ 15,476	1,710	$ 6.00	$ 10,258	$ 25,735
Large Coal Mines	51,145	$ 1.61	$ 82,343	892	$ 6.00	$ 5,351	$ 87,694
Total	60,757		$ 97,819	2,602		$ 15,609	$ 113,429
Small M/NM Mines	36,245	$ 1.61	$ 58,354	6,776	$ 5.30	$ 35,911	$ 94,265
Large M/NM Mines	64,518	$ 1.61	$ 103,874	1,098	$ 5.30	$ 5,820	$ 109,693
Total	100,763		$ 162,228	7,874		$ 41,730	$ 203,958

[a] # of Miners = the number of miners eligible to take audiometric examination as a result of the final rule (from Table IV-32).

[b] Cost per miner = (0.08 X $17) + $0.25, where 0.08 is the number of hours needed per miner for a clerical worker to prepare and distribute a written notification; $17 is the hourly wage rate for a clerical worker; and $0.25 is the photocopying expense for notification per miner.

[c] # of mines = the number of mines with miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[d] Cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours needed per mine for a supervisor to give instructions to a clerical worker about audiometric testing notification; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for metal/nonmetal mine supervisor.

The total yearly compliance costs associated with § 62.170 of the final rule are summarized in Table IV-36.

TABLE IV-36: Summary of the Annual Cost to Mine Operators Resulting from § 62.170 of the Final Rule*

Task	Coal		Metal & Nonmetal		Total Costs for all Mines
	Small	Large	Small	Large	
Audiograms	$ 141,632	$ 753,554	$ 505,417	$ 899,668	$ 2,300,271
Notification	$ 25,735	$ 87,694	$ 94,265	$ 109,693	$ 317,387
Total	$ 167,367	$ 841,248	$ 599,682	$ 1,009,362	$ 2,617,658

* Source: Table IV-34 and Table IV-35.

4. § 62.171 Audiometric Test Procedures

Section 62.171 of the final rule requires the mine operator to maintain audiometric test records which include evidence that

the audiometric test was conducted in accordance with the specifications of this section. MSHA anticipates that it will take an average of 0.1 hours per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records and that it will take an average of 0.08 hours per miner for a clerical worker to maintain the miner's audiometric test record. The cost of a file folder and related materials is estimated to be $0.25 per miner.

Table IV-37 provides MSHA's estimate of the cost of maintaining audiometric test records the first year after the final rule becomes effective. These estimates are based on the assumption that all eligible miners will take an audiometric examination in Year 1 and that audiometric test records must be maintained for all these miners. These estimates also include recordkeeping costs for audiometric retests and otological exams and clinical audiological evaluations (as described in §§ 62.172 and 62.173 of the final rule) for the first year after the final rule becomes effective.

TABLE IV-37: The Cost to Mine Operators Resulting from § 62.171 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	10,625	$ 1.61	$ 17,106	1,710	$ 6.00	$ 10,258	$ 27,364
Large Coal Mines	56,579	$ 1.61	$ 91,093	892	$ 6.00	$ 5,351	$ 96,444
Total	67,204		$ 108,198	2,602		$ 15,609	$ 123,808
Small M/NM Mines	40,060	$ 1.61	$ 64,497	6,776	$ 5.30	$ 35,911	$ 100,408
Large M/NM Mines	71,373	$ 1.61	$ 114,910	1,098	$ 5.30	$ 5,820	$ 120,730
Total	111,433		$ 179,407	7,874		$ 41,730	$ 221,137

[a] # of Miners = a+b+c, where a is the number of miners eligible to take audiometric examination as a result of the final rule (from Table IV-32); b is the number of miners taking an audiometric retest first year final rule (from Table IV-45); and c is the number of miners having an otological exam or clinical audiological evaluation first year final rule (from Table IV-45).

[b] Cost per miner = (0.08 X $17) + $0.25, where 0.08 is the number of hours needed per miner for a clerical worker to maintain the miner's audiometric test record; $17 is the hourly wage rate for a clerical worker; and $0.25 is the expense per miner for a file folder and related materials.

[c] # of mines = the number of mines with miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[d] Cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours needed per mine for a supervisor to give instructions to a clerical worker about maintaining audiometric test records; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for metal/nonmetal mine supervisor.

Table IV-38 provides MSHA's estimates of the cost of maintaining audiometric test records over a 10-year period, from Year 1 to Year 10. These estimates include recordkeeping costs for audiometric retests and otological exams and clinical audiological evaluations over the 10-year period. The estimates are based on the assumption that only 15% of eligible miners will choose to have an audiometric examination in Years 2-10 and that only audiometric test records for these miners will need to be updated and maintained. The present value of the costs for Years 1-10 and the annualized cost in Table IV-38 were calculated using a discount rate of 7%. The annualized cost is the sum of the discounted present values of the costs multiplied by the annualization factor. The annualized cost, disaggregated for large and small coal and metal/nonmetal mines, is summarized in Table IV-39.

TABLE IV-38: The Cost to Mine Operators Resulting from § 62.171 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines by Year [a]	Total Cost for M/NM Mines by Year [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 123,808	$ 221,137	$ 344,945	0.9345794	$ 115,708	$ 206,671	$ 322,379
2	$ 18,571	$ 33,171	$ 51,742	0.8734387	$ 16,221	$ 28,973	$ 45,193
3	$ 18,571	$ 33,171	$ 51,742	0.8162979	$ 15,160	$ 27,077	$ 42,237
4	$ 18,571	$ 33,171	$ 51,742	0.7628952	$ 14,168	$ 25,306	$ 39,474
5	$ 18,571	$ 33,171	$ 51,742	0.7129862	$ 13,241	$ 23,650	$ 36,891
6	$ 18,571	$ 33,171	$ 51,742	0.6663422	$ 12,375	$ 22,103	$ 34,478
7	$ 18,571	$ 33,171	$ 51,742	0.6227497	$ 11,565	$ 20,657	$ 32,222
8	$ 18,571	$ 33,171	$ 51,742	0.5820091	$ 10,809	$ 19,306	$ 30,114
9	$ 18,571	$ 33,171	$ 51,742	0.5439337	$ 10,101	$ 18,043	$ 28,144
10	$ 18,571	$ 33,171	$ 51,742	0.5083493	$ 9,441	$ 16,862	$ 26,303
	Total			7.0235815	$ 228,788	$ 408,647	$ 637,435
	Annualized Cost [c]				$ 32,574	$ 58,182	$ 90,756

[a] Total cost for coal and M/NM mines to maintain audiometric test record for Year 1 = t (from Table IV-37). Total cost for coal and M/NM mines for each of Years 2-10 = 15% Xt.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

TABLE IV-39: Summary of Annualized Cost to Mine Operators Resulting from § 62.171 of the Final Rule*

Task	Coal	M/NM
Small	$ 7,200	$ 26,418
Large	$ 25,375	$ 31,764
Total	$ 32,574	$ 58,182

* Source: Table IV-37 and Table IV-38.

5. § 62.172 Evaluation of Audiogram

Under § 62.172 of the final rule, the mine operator is required to have a skilled medical professional compare the annual audiogram to the miner's baseline audiogram to determine if a standard threshold shift or a reportable hearing loss has occurred. Allowance may be made for the effects of aging. (The cost of this service is included in the cost of the audiometric test, which has already been estimated under § 62.170 of the final rule.)

MSHA estimates that it will take an average of 0.1 hours per mine for a mine supervisor to instruct a clerical worker to provide a skilled medical professional with a copy of the miners' audiometric test records and that it will take an average of 0.08 hours for the clerical worker to provide a copy of each miner's audiometric test records to a skilled medical professional. The

cost of photocopying each miner’s audiometric test record is estimated to be $0.25, and the

postage cost, per mine, of mailing all the miners' audiometric test records to a skilled medical professional is estimated to be $5.00 for a small mine and $10.00 for a large mine.

Section 62.172 of the final rule also requires mine operators to instruct the physician, audiologist, or qualified technician not to reveal to the operator any findings unrelated to the miner's exposure to noise or the miner's wearing of a hearing protector.

MSHA estimates that it will take an average of 0.1 hours per mine for the mine supervisor to instruct the clerical worker about informing a physician, audiologist, or qualified technician as specified by § 62.172 of the final rule and that it will take 0.2 hours per mine for the clerical worker to inform a physician, audiologist, or qualified technician.

Table IV-40 provides MSHA's estimate of the cost——for the first year after the final rule becomes effective——of providing a copy of the miners' audiometric test records and informing physicians, audiologists, and qualified technicians as specified by this provision. Table IV-41 provides MSHA's estimates of the cost——over a ten-year period, from Year 1 to Year 10——of providing a copy of the miners' audiometric test records and informing physicians, audiologists, and qualified technicians as specified by this provision. The present value of the costs for

Years 1-10 and the annualized cost in Table IV-41 were calculated using a discount rate of 7%.

TABLE IV-40: The Cost of Providing Audiometric Test Records and Instructing Physicians, Audiologists, and Qualified Technicians in Accordance with § 62.172 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	9,613	$ 1.61	$ 15,476	1,609	$ 20.65	$ 33,224	$ 48,700
Large Coal Mines	51,145	$ 1.61	$ 82,343	706	$ 25.65	$ 18,099	$ 100,441
Total	60,757		$ 97,819	2,315		$ 51,323	$ 149,142
Small M/NM Mines	36,245	$ 1.61	$ 58,354	6,437	$ 19.25	$ 123,909	$ 182,263
Large M/NM Mines	64,518	$ 1.61	$ 103,874	878	$ 24.25	$ 21,302	$ 125,176
Total	100,763		$ 162,228	7,315		$ 145,211	$ 307,439

[a] The number of miners = the number of miners taking an audiometric test first year final rule (from Table IV-32).

[b] Cost per miner = (0.08 X $17) + $0.25, where 0.08 is the number of hours required per miner for a clerical worker to provide audiometric test records; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner for photocopying (audiometric test records).

[c] The number of mines = n/a, where n is the number of miners taking an audiometric test first year final rule (from Table IV-35) and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] The cost per mine = (2 X 0.1 X ($17 + w_s)) + ($17 X 0.2) + $0.25 + p, where 2 refers to a mine supervisor giving 2 sets of instructions to a clerical worker, one about providing audiometric test records and one about informing physicians, audiologists, and qualified technicians; 0.1 is the number of hours needed per mine for a supervisor to give a set of instructions to a clerical worker; $17 is the hourly wage for a clerical worker; w_s is the hourly wage rate for a mine supervisor and w_s =$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor; 0.2 is the number of hours required for a clerical worker to instruct a physician, audiologist, or qualified technician; $0.25 is the cost for photocopying (the notice to physician, audiologist, or qualified technician); and p is the postage cost of mailing the audiometric test records to a physician, audiologist, or qualified technician, and p=$5 for a small mine and p=$10 for a large mine.

TABLE IV-43: The Cost to Mine Operators of Audiometric Retesting as a Result of § 62.172 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 540,740	$ 851,445	$ 1,392,185	0.9345794	$ 505,364	$ 795,743	$ 1,301,107
2	$ 81,111	$ 127,717	$ 208,828	0.8734387	$ 70,845	$ 111,553	$ 182,398
3	$ 81,111	$ 127,717	$ 208,828	0.8162979	$ 66,211	$ 104,255	$ 170,466
4	$ 81,111	$ 127,717	$ 208,828	0.7628952	$ 61,879	$ 97,435	$ 159,314
5	$ 81,111	$ 127,717	$ 208,828	0.7129862	$ 57,831	$ 91,060	$ 148,891
6	$ 81,111	$ 127,717	$ 208,828	0.6663422	$ 54,048	$ 85,103	$ 139,151
7	$ 81,111	$ 127,717	$ 208,828	0.6227497	$ 50,512	$ 79,536	$ 130,047
8	$ 81,111	$ 127,717	$ 208,828	0.5820091	$ 47,207	$ 74,332	$ 121,540
9	$ 81,111	$ 127,717	$ 208,828	0.5439337	$ 44,119	$ 69,469	$ 113,588
10	$ 81,111	$ 127,717	$ 208,828	0.5083493	$ 41,233	$ 64,925	$ 106,157
	Total			7.0235815	$ 999,249	$ 1,573,411	$ 2,572,660
	Annualized Cost [c]				$ 142,271	$ 224,018	$ 366,289

[a] Total cost for coal and M/NM mine operators to provide audiometric retesting for Year 1 = t (from Table IV-42). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

The total annualized compliance cost associated with § 62.172 of the final rule is summarized in table IV-44.

TABLE IV-44: Summary of the Annualized Cost to Mine Operators Resulting from § 62.172 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Provide Copy of Audiogram and Information to Audiologists	$ 12,813	$ 26,426	$ 47,954	$ 32,934	$ 120,128
Audiometric Retests	$ 22,509	$ 119,761	$ 80,581	$ 143,438	$ 366,289
Total	$ 35,323	$ 146,188	$ 128,535	$ 176,372	$ 486,417

*Source: Table IV-40, Table IV-41, Table IV-42, and Table IV-43.

6. § 62.173 Follow-up Evaluation

Under the final rule, if a valid audiogram cannot be obtained due to a medical pathology of the ear which the physician or audiologist suspects was caused or aggravated by the miner's exposure to noise or the wearing of hearing protectors, the mine operator must refer the miner for a clinical audiological evaluation or an otological examination, whichever is appropriate. The additional tests and exams must be provided by the mine operator at no cost to the miner. If a reportable hearing loss is confirmed, the mine operator must report it to MSHA under existing 30 CFR part 50 requirements.

In addition, under the final rule, if the medical pathology of the ear is not work-related, the mine operator must instruct the physician or audiologist to inform the miner about the need for an otological examination. The physician or audiologist must also be instructed not to reveal to the operator any specific findings or diagnoses unrelated to the miner's noise exposure or the wearing of hearing protection without the written consent of the miner.

For the proposed rule’s RIA, MSHA assumed that 5% of the retested miners would require a clinical audiological evaluation or an otological examination, where retested miners did not include miners now covered by a voluntary hearing conservation program (HCP). Testimony at the public hearings indicated, however, that most voluntary HCPs do not contain provisions for clinical audiological evaluations or otological examinations. For this reason, MSHA adjusted its estimates of the number of miners requiring a clinical audiological evaluation or an otological examination the first year after the final rule becomes effective to include 0.5% of the miners currently covered by a voluntary HCP. For subsequent years (Years 2-10) after the final rule becomes effective, MSHA again assumed that the number of miners requiring a clinical audiological evaluation or an otological examination is 15% of the estimate for the first year. Table IV-45 provides MSHA’s estimate of the number of miners

requiring a clinical audiological evaluation or an otological examination as a result of the final rule.

TABLE IV-41: The Cost of Providing Audiometric Test Records and Instructing Physicians, Audiologists, and Qualified Technicians in Accordance with § 62.172 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines by Year [a]	Total Cost for M/NM Mines by Year [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 149,142	$ 307,439	$ 456,581	0.9345794	$ 139,385	$ 287,326	$ 426,711
2	$ 22,371	$ 46,116	$ 68,487	0.8734387	$ 19,540	$ 40,279	$ 59,819
3	$ 22,371	$ 46,116	$ 68,487	0.8162979	$ 18,262	$ 37,644	$ 55,906
4	$ 22,371	$ 46,116	$ 68,487	0.7628952	$ 17,067	$ 35,182	$ 52,248
5	$ 22,371	$ 46,116	$ 68,487	0.7129862	$ 15,950	$ 32,880	$ 48,830
6	$ 22,371	$ 46,116	$ 68,487	0.6663422	$ 14,907	$ 30,729	$ 45,636
7	$ 22,371	$ 46,116	$ 68,487	0.6227497	$ 13,932	$ 28,719	$ 42,650
8	$ 22,371	$ 46,116	$ 68,487	0.5820091	$ 13,020	$ 26,840	$ 39,860
9	$ 22,371	$ 46,116	$ 68,487	0.5439337	$ 12,168	$ 25,084	$ 37,252
10	$ 22,371	$ 46,116	$ 68,487	0.5083493	$ 11,372	$ 23,443	$ 34,815
	Total			7.0235815	$ 275,603	$ 568,126	$ 843,729
	Annualized Cost [c]				$ 39,240	$ 80,888	$ 120,128

[a] Total cost for coal and M/NM mine operators to provide audiometric test records and instruct physicians, audiologists, and qualified technicians for Year 1 = t (from Table IV-40). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

is appropriate. The additional tests and exams must be provided by the mine operator at no cost to the miner. If a reportable hearing loss is confirmed, the mine operator must report it to MSHA under existing 30 CFR part 50 requirements.

In addition, under the final rule, if the medical pathology of the ear is not work-related, the mine operator must instruct the physician or audiologist to inform the miner about the need for an otological examination. The physician or audiologist must also be instructed not to reveal to the operator any specific findings or diagnoses unrelated to the miner's noise exposure or the wearing of hearing protection without the written consent of the miner.

For the proposed rule’s RIA, MSHA assumed that 5% of the retested miners would require a clinical audiological evaluation or an otological examination, where retested miners did not include miners now covered by a voluntary hearing conservation program (HCP). Testimony at the public hearings indicated, however, that most voluntary HCPs do not contain provisions for clinical audiological evaluations or otological examinations. For this reason, MSHA adjusted its estimates of the number of miners requiring a clinical audiological evaluation or an otological examination the first year after the final rule

becomes effective to include 0.5% of the miners currently covered by a voluntary HCP. For subsequent years (Years 2-10) after the final rule becomes effective, MSHA again assumed that the number of miners requiring a clinical audiological evaluation or an otological examination is 15% of the estimate for the first year. Table IV-45 provides MSHA's estimate of the number of miners

requiring a clinical audiological evaluation or an otological examination as a result of the final rule.

TABLE IV-45: The Number of Miners Having Clinical Audiological Evaluations or Otological Exams Under the Final Rule

Type	Coal		Metal/Nonmetal	
	Small	Large	Small	Large
Number of Miners under Voluntary HCPs [a]	511	12,929	1,908	16,129
Number of Miners Taking Audiometric Test First Year Final Rule [a]	9,613	51,145	36,245	64,518
Number of Miners Taking Audiometric Tests Subsequent Years Final Rule [a]	1,442	7,672	5,437	9,678
Number of Miners Retested First Year Final Rule [b]	961	5,114	3,624	6,452
Number of Miners Retested Subsequent Years Final Rule [b]	144	767	544	968
Number of Miners Having Otological Exam First Year Final Rule [c]	51	320	191	403
Number of Miners Having Otological Exam Subsequent Years Final Rule [d]	8	48	29	60

[a] Source: Table IV-32.

[b] Number of miners retested = 10% X t, where t is the number of miners taking audiometric tests first year or each subsequent year final rule (from Table IV-32).

[c] Number of miners having otological exam first year final rule = (5% X r) + (0.5% X h), where r is the number of miners retested the first year final rule and h is the number of miners under a voluntary HCP.

[d] The number of miners having otological exam subsequent years final rule = 15% X e, where e is the number of miners having an otological examination the first year final rule.

MSHA estimates that it will take an average of 0.1 hours per mine for a mine supervisor to instruct a clerical worker about notifying appropriate miners to have a clinical audiological evaluation or an otological examination and that it will take an average of 0.08 hours for the clerical worker to notify each miner. The cost of photocopying the written notification is estimated to be $0.25 per miner. MSHA further estimates that it will take an average of 0.1 hours per mine for the mine supervisor to instruct the clerical worker about notifying a physician or audiologist as specified by § 62.173 of the final rule and that it will take an average of 0.2 hours per mine for the clerical worker to notify a physician or audiologist.

Table IV-46 provides MSHA's estimate of the cost, for the first year after the final rule becomes effective, of notifying miners and physicians and audiologists as specified by this provision. Table IV-47 provides MSHA's estimates of the cost, over a ten-year period, from Year 1 to Year 10, of notifying miners and physicians and audiologists as specified by this provision. The present value of the costs for Years 1-10 and the annualized cost in Table IV-50 were calculated using a discount rate of 7%.

TABLE IV-46: The Cost of Notifying Miners and Physicians and Audiologists in Accordance with § 62.173 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost for Miners	# of Mines [c]	Cost per Mine[d]	Cost for Mines	Total Costs
Small Coal Mines	51	$ 1.61	$ 81	8	$ 15.65	$ 133	$ 214
Large Coal Mines	320	$ 1.61	$ 516	4	$ 15.65	$ 69	$ 585
Total	371		$ 597	13		$ 202	$ 799
Small M/NM Mines	191	$ 1.61	$ 307	34	$ 14.25	$ 483	$ 790
Large M/NM Mines	403	$ 1.61	$ 649	5	$ 14.25	$ 78	$ 727
Total	594		$ 956	39		$ 561	$ 1,517

[a] Number of miners = the number of miners having a clinical audiological evaluation or an otological examination first year final rule (from Table IV-45).

[b] Cost per miner = (0.08 X $17) + $0.25, where 0.08 refers to the number of hours required, per miner, for a clerical worker to notify a miner; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner for photocopying a written notification.

[c] The number of mines = n/a, where n is the number of miners having a clinical audiological evaluation or an otological examination first year final rule (from Table IV-48) and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] Cost per mine = (2 X 0.1 X ($17 +$w_s$)) + (0.2 X $17) + $0.25, where 2 refers to providing 2 sets of instructions, one about miners and one about physicians and audiologists; 0.1 is the number of hours needed per mine for a supervisor to give a set of instructions to a clerical worker; $17 is the hourly wage for a clerical worker; w_s is the hourly wage rate for a mine supervisor and w_s =$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor; 0.2 is the number of hours needed per mine for a clerical worker to instruct a physician or audiologist; and $0.25 is the cost for photocopying (notice to physician, audiologist, or qualified technician).

TABLE IV-47: The Cost of Notifying Miners and Physicians and Audiologists in Accordance with § 62.173 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines by Year [a]	Total Cost for M/NM Mines by Year [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 799	$ 1,517	$ 2,316	0.9345794	$ 747	$ 1,418	$ 2,165
2	$ 120	$ 228	$ 347	0.8734387	$ 105	$ 199	$ 303
3	$ 120	$ 228	$ 347	0.8162979	$ 98	$ 186	$ 284
4	$ 120	$ 228	$ 347	0.7628952	$ 91	$ 174	$ 265
5	$ 120	$ 228	$ 347	0.7129862	$ 85	$ 162	$ 248
6	$ 120	$ 228	$ 347	0.6663422	$ 80	$ 152	$ 232
7	$ 120	$ 228	$ 347	0.6227497	$ 75	$ 142	$ 216
8	$ 120	$ 228	$ 347	0.5820091	$ 70	$ 132	$ 202
9	$ 120	$ 228	$ 347	0.5439337	$ 65	$ 124	$ 189
10	$ 120	$ 228	$ 347	0.5083493	$ 61	$ 116	$ 177
	Total			7.0235815	$ 1,477	$ 2,804	$ 4,281
	Annualized Cost [c]				$ 210	$ 399	$ 609

[a] Total cost for coal and M/NM mine operators to notify mine operators and audiologists for Year 1 = t (from Table IV-46). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

For the proposed rule's RIA, MSHA estimated that a clinical audiological evaluation or an otological examination would cost about $250 and would take about 2 hours to perform. MSHA has reconsidered its estimates in light of public comments.

Commenters provided five estimates for the cost of a clinical audiological evaluation or an otological examination,

ranging from $50 to $189.30 for an otological exam. Based on this evidence, MSHA is adjusting its estimate to $150 for a clinical audiological evaluation or otological examination. MSHA believes that this amount is reflective of all the data it received during the rulemaking process and represents a more appropriate estimate than the one used for the proposed rule's RIA.

In addition, some mine operators submitted estimates of 4 to 8 hours for the time required to complete a clinical audiological evaluation or otological examination. MSHA believes that these time estimates are unusually high, in light of its experience with complex medical exams. For the final REA, MSHA has increased its estimate to three hours for a miner to take a clinical audiological evaluation or otological examination. The testimony of a professional at one of the hearings suggests that MSHA's original estimate is not necessarily too low, but MSHA is giving some consideration to the data submitted by mine operators with hearing conservation programs.

Table IV-48 provides MSHA's estimate of the cost of clinical audiological evaluations and otological examinations the first year after the final rule becomes effective. Table IV-49 provides MSHA's estimates of the cost of clinical audiological evaluations and otological examinations over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years

1-10 and the annualized cost in Table IV-49 were calculated using a discount rate of 7%. The annualized cost is the sum of the discounted present values of the costs multiplied by the annualization factor.

TABLE IV-48: Cost of Clinical Audiological Evaluations and Otological Examinations as a Result of the Final Rule (Year 1)

Size	Coal			Metal/Nonmetal			Total Costs for All Mines
	# of Miners [a]	Cost per Miner[b]	Total Cost	# of Miners [a]	Cost per Miner[b]	Total Cost	
Small	51	$ 228	$ 11,541	191	$ 219	$ 41,777	$ 53,318
Large	320	$ 228	$ 73,044	403	$ 219	$ 88,309	$ 161,353
Total	371		$ 84,585	594		$ 130,086	$ 214,671

[a] Number of miners = number of miners requiring clinical audiological evaluations or otological examinations the first year of the final rule (from Table IV-45).

[b] Cost per miner = $150 + (3 X w_m), where $150 is the cost of a clinical audiological evaluation or otological examination; 3 is the number of hours for a miner to take a clinical audiological evaluation or otological examination; and w_m is the hourly wage rate for a miner and w_m=$26 for a coal miner and w_m=$23 for a metal/nonmetal miner.

TABLE IV-49: Cost of Clinical Audiological Evaluations and Otological Examinations as a Result of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 84,585	$ 130,086	$ 214,671	0.9345794	$ 79,051	$ 121,576	$ 200,627
2	$ 12,688	$ 19,513	$ 32,201	0.8734387	$ 11,082	$ 17,043	$ 28,125
3	$ 12,688	$ 19,513	$ 32,201	0.8162979	$ 10,357	$ 15,928	$ 26,285
4	$ 12,688	$ 19,513	$ 32,201	0.7628952	$ 9,679	$ 14,886	$ 24,566
5	$ 12,688	$ 19,513	$ 32,201	0.7129862	$ 9,046	$ 13,912	$ 22,959
6	$ 12,688	$ 19,513	$ 32,201	0.6663422	$ 8,454	$ 13,002	$ 21,457
7	$ 12,688	$ 19,513	$ 32,201	0.6227497	$ 7,901	$ 12,152	$ 20,053
8	$ 12,688	$ 19,513	$ 32,201	0.5820091	$ 7,384	$ 11,357	$ 18,741
9	$ 12,688	$ 19,513	$ 32,201	0.5439337	$ 6,901	$ 10,614	$ 17,515
10	$ 12,688	$ 19,513	$ 32,201	0.5083493	$ 6,450	$ 9,919	$ 16,369
	Total			7.0235815	$ 156,307	$ 240,389	$ 396,696
	Annualized Cost [c]				$ 22,255	$ 34,226	$ 56,481

[a] Total cost for coal and M/NM mine operators to provide clinical audiological evaluations and otological examinations for Year 1 = t (from Table IV-48). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

The total annualized compliance cost associated with § 62.173 of the final rule is summarized in Table IV-50.

TABLE IV-50: Summary of Annualized Costs to Mine Operators Resulting from § 62.173 of the Final Rule*

Task	Coal		Metal and Nonmetal		Total
	Small	Large	Small	Large	
Cost to Notify Miners and Physicians	$ 56	$ 154	$ 208	$ 191	$ 609
Cost of Otological Exam	$ 3,036	$ 19,218	$ 10,992	$ 23,234	$ 56,481
Total	$ 3,093	$ 19,372	$ 11,200	$ 23,426	$ 57,090

*Source: Table IV-46, Table IV-47, Table IV-48, and TableI V-49.

7. § 62.174 Follow-up Corrective Measures

Under § 62.174 of the final rule, within 30 days of receiving evidence of a miner's work-related standard threshold shift (STS), the mine operator must perform the following corrective tasks: (1) retrain the miner and keep a record of retraining; (2) permit the miner to select an additional or different hearing protector from among those offered by the mine operator; and (3) review the effectiveness of engineering and administrative controls to identify and correct any deficiencies.

All miners found to have an STS must be retrained. MSHA expects that all retested miners will exhibit a work-related STS.

In addition, some miners who are covered by an existing voluntary HCP will have a work-related STS and, therefore, must be

retrained. The Agency believes that most current voluntary HCPs do not include this retraining requirement. Few mine operators at the public hearings mentioned this component as part of their HCPs. MSHA, therefore, assumes that the retraining of retested miners covered by an existing voluntary HCP is properly attributable to the final rule. MSHA also assumes that 0.5% of miners who are covered by an existing voluntary HCP will have a work-related STS each year.

Table IV-51 presents MSHA's estimate of the number of miners requiring retraining in response to the final rule.

TABLE IV-51: The Number of Miners Requiring Retraining as a Result of § 62.174 of the Final Rule

Type	Coal		Metal/Nonmetal	
	Small	Large	Small	Large
Number of Miners Retested First Year Final Rule [a]	961	5,114	3,624	6,452
Number of Miners Retested Subsequent Years Final Rule [a]	144	767	544	968
Number of Miners in Voluntary HCP with STS [b]	3	65	10	81
Total Number of Miners Retrained First Year Final Rule [c]	964	5,179	3,634	6,532
Total Number of Miners Retrained Subsequent Years Final Rule [d]	147	832	553	1,048

[a] Source: Table IV-45.

[b] Number of miners in voluntary HCP with STS = 0.5% X n, where n is the number of miners in a voluntary HCP (from Table IV-32).

[c] Total number of miners retrained first year final rule = r + v, where r is the number of miners retested the first year final rule and v is the number of miners in a voluntary HCP with an STS each year.

[d] Total number of miners retrained each subsequent year final rule = q + v, where q is the number of miners retested each subsequent year final rule and v is the number of miners in a voluntary HCP with an STS each year.

MSHA estimates that a supervisor can retrain miners in a 0.35-hour retraining session, which would include a nominal

amount of time for miners to select a different type of hearing protection. Mine operators must have at least two plug and two muff types of hearing protection available to satisfy the final rule's requirements in this regard. A supervisor can retrain all the miners in a small mine operation in one session, but for a large mine operation, the supervisor will require three sessions, on average, to retrain all the miners.

Table IV-52 provides MSHA’s estimate of the cost of retraining workers the first year after the final rule becomes effective. Table IV-53 provides MSHA’s estimates of the cost of retraining workers over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-53 were calculated using a discount rate of 7%.

TABLE IV-52: The Cost of Retraining Miners as a Result of § 62.174 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	964	$ 9.10	$ 8,771	161	$ 15.05	$ 2,428	$ 11,199
Large Coal Mines	5,179	$ 9.10	$ 47,130	71	$ 45.15	$ 3,226	$ 50,356
Total	6,143		$ 55,901	233		$ 5,654	$ 61,555
Small M/NM Mines	3,634	$ 8.05	$ 29,254	645	$ 12.60	$ 8,132	$ 37,386
Large M/NM Mines	6,532	$ 8.05	$ 52,586	89	$ 37.80	$ 3,362	$ 55,948
Total	10,166		$ 81,840	734		$ 11,494	$ 93,334

[a] Number of miners = the number of miners retrained first year final rule (from Table IV-51).

[b] Cost per miner = 0.35 X w_m, where 0.35 is the number of hours of retraining required per miner and w_m is the hourly wage rate for a miner and w_m=$26 for a coal miner and w_m=$23 for a M/NM miner.

[c] The number of mines = n/a, where n is the number of miners retrained first year final rule (from Table IV-51) and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] Cost per mine = 0.35 X w_s X r, where 0.35 is the number of hours a supervisor requires to retrain miners in a retraining session; w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor; and r is the number of sessions required and r=1 for a small mine and r=3 for a large mine.

TABLE IV-53: The Cost of Retraining Miners as a Result of § 62.174 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor[b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 61,555	$ 93,334	$ 154,888	0.9345794	$ 57,528	$ 87,228	$ 144,755
2	$ 9,793	$ 14,671	$ 24,463	0.8734387	$ 8,553	$ 12,814	$ 21,367
3	$ 9,793	$ 14,671	$ 24,463	0.8162979	$ 7,994	$ 11,976	$ 19,969
4	$ 9,793	$ 14,671	$ 24,463	0.7628952	$ 7,471	$ 11,192	$ 18,663
5	$ 9,793	$ 14,671	$ 24,463	0.7129862	$ 6,982	$ 10,460	$ 17,442
6	$ 9,793	$ 14,671	$ 24,463	0.6663422	$ 6,525	$ 9,776	$ 16,301
7	$ 9,793	$ 14,671	$ 24,463	0.6227497	$ 6,098	$ 9,136	$ 15,234
8	$ 9,793	$ 14,671	$ 24,463	0.5820091	$ 5,699	$ 8,538	$ 14,238
9	$ 9,793	$ 14,671	$ 24,463	0.5439337	$ 5,327	$ 7,980	$ 13,306
10	$ 9,793	$ 14,671	$ 24,463	0.5083493	$ 4,978	$ 7,458	$ 12,436
	Total			7.0235815	$ 117,155	$ 176,557	$ 293,712
	Annualized Cost [c]				$ 16,680	$ 25,138	$ 41,818

[a] Total cost for coal and M/NM mine operators to retrain miners Year 1 (from Table IV-52). Total cost for coal and M/NM mine operators for each of Years 2-10 = $((q_s + q_l) \times c_b) + ((q_s / a_s) \times c_s) + (q_l / a_l) \times c_l)$, where q_s is the number of miners in small mines retrained subsequent years final rule (from Table IV-54); q_l is the number of miners in large mines retrained subsequent years final rule (from Table IV-51); c_b is the cost of retraining per miner (from Table IV-52); a_s is the average number of miners per small mine (from Table IV-4); a_l is the average number of miners per large mine (from Table IV-4); c_s is the cost of retraining per small mine (from Table IV-52); and c_l is the cost of retraining per large mine (from Table IV-52).

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

In addition to the retraining itself, the final rule requires mine operators to prepare and retain a certification of retraining. MSHA estimates that this task will require 0.05 hours of a clerical worker's time per miner to certify the date and type of training and to maintain the certification. The cost of photocopying associated with this task is estimated to be $0.25 per miner.

Table IV-54 provides MSHA's estimate of the cost to mine operators the first year after the final rule becomes effective of preparing and retaining a certification of retraining. Table IV-58 provides MSHA's estimates of the cost of preparing and retaining a certification of retraining over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-55 were calculated using a discount rate of 7%.

TABLE IV-54: The Cost of Preparing & Retaining a Certification of Retraining as a Result of § 62.174 of the Final Rule (Year 1)

Size	Coal			Metal/Nonmetal			Total Costs for All Mines
	# of Miners [a]	Cost per Miner[b]	Total Cost	# of Miners [a]	Cost per Miner[b]	Total Cost	
Small	964	$ 1.10	$ 1,060	3,634	$ 1.10	$ 3,997	$ 5,058
Large	5,179	$ 1.10	$ 5,697	6,532	$ 1.10	$ 7,186	$ 12,883
Total	6,143		$ 6,757	10,166		$ 11,183	$ 17,940

[a] Number of miners = number of miners retrained first year of the final rule (from Table IV-51).

[b] Cost per miner = (0.05 X $17) + $0.25, where 0.05 is the number of hours, per miner, a clerical worker needs to prepare and retain a certification of retraining; $17 is the hourly wage rate for a clerical worker; and $0.25 is the associated photocopying expense per miner.

TABLE IV-55: The Cost of Preparing and Retaining a Certification of Retraining as a Result of § 62.174 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 6,757	$ 11,183	$ 17,940	0.9345794	$ 6,315	$ 10,452	$ 16,767
2	$ 1,076	$ 1,762	$ 2,838	0.8734387	$ 940	$ 1,539	$ 2,479
3	$ 1,076	$ 1,762	$ 2,838	0.8162979	$ 879	$ 1,438	$ 2,317
4	$ 1,076	$ 1,762	$ 2,838	0.7628952	$ 821	$ 1,344	$ 2,165
5	$ 1,076	$ 1,762	$ 2,838	0.7129862	$ 767	$ 1,256	$ 2,024
6	$ 1,076	$ 1,762	$ 2,838	0.6663422	$ 717	$ 1,174	$ 1,891
7	$ 1,076	$ 1,762	$ 2,838	0.6227497	$ 670	$ 1,097	$ 1,767
8	$ 1,076	$ 1,762	$ 2,838	0.5820091	$ 626	$ 1,025	$ 1,652
9	$ 1,076	$ 1,762	$ 2,838	0.5439337	$ 585	$ 958	$ 1,544
10	$ 1,076	$ 1,762	$ 2,838	0.5083493	$ 547	$ 896	$ 1,443
	Total			7.0235815	$ 12,869	$ 21,179	$ 34,048
	Annualized Cost [c]				$ 1,832	$ 3,015	$ 4,848

[a] Total cost for coal and M/NM mine operators to prepare and retain a certification of retraining Year 1 = t (from Table IV-54). Total cost for coal and M/NM mine operators for each of Years 2-10 = (q / r) X t, where q is the number of miners retrained subsequent years final rule (from Table IV-51) and r is the number of miners retrained first year final rule (from Table IV-51).

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

Section 62.174 of the final rule also requires mine operators to review the effectiveness of engineering and administrative controls within 30 days of receiving evidence of

Section 62.174 of the final rule also requires mine operators to review the effectiveness of engineering and administrative controls within 30 days of receiving evidence of a miner's work-related standard threshold shift. MSHA estimates that this task will require, for a small mine, 0.75 hours of a supervisor's time and 0.5 hours of a clerical worker's time; for a large mine, this task will require 1.5 hours of a supervisor's time and 0.75 hours of a clerical worker's time.

Table IV-56 provides MSHA's estimate of the cost to mine operators of reviewing the effectiveness of engineering and administrative controls the first year after the final rule becomes effective. Table IV-57 provides MSHA's estimates of the cost of reviewing the effectiveness of engineering and adminstrative controls over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-57 were calculated using a discount rate of 7%.

TABLE IV-56: The Cost of Reviewing Engineering and Administrative Controls as a Result of § 62.174 of the Final Rule (Year 1)

Size	Coal			Metal/Nonmetal			Total Costs for All Mines
	# of Mines [a]	Cost per Mine [b]	Total Cost	# of Mines [a]	Cost per Mine [b]	Total Cost	
Small	161	$ 40.75	$ 6,574	645	$ 35.50	$ 22,911	$ 29,485
Large	71	$ 77.25	$ 5,520	89	$ 66.75	$ 5,937	$ 11,457
Total	233		$ 12,093	734		$ 28,848	$ 40,941

[a] The number of mines = n / a, where n is the number of miners retrained the first year final rule (from Table IV-51) and a is the average number of miners per mine of that type and size (from Table IV-4).

[b] The cost per mine = $(h_s \times w_s) + (h_c \times \$17)$, where h_s is the number of hours of a supervisor's time needed to review engineering and administrative controls and $h_s = 0.75$ for a small mine and $h_s = 1.5$ for a large mine; w_s is the hourly wage rate for a supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor; h_c is the number of hours of a clerical worker's time required to assist the supervisor in reviewing engineering and administrative controls and h_c=0.5 for a small mine and h_c=0.75 for a large mine; and $17 is the hourly wage rate for a clerical worker.

TABLE IV-57: The Cost of Reviewing Engineering and Administrative Controls as a Result of § 62.174 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 12,093	$ 28,848	$ 40,941	0.9345794	$ 11,302	$ 26,961	$ 38,263
2	$ 1,887	$ 4,441	$ 6,328	0.8734387	$ 1,649	$ 3,879	$ 5,527
3	$ 1,887	$ 4,441	$ 6,328	0.8162979	$ 1,541	$ 3,625	$ 5,165
4	$ 1,887	$ 4,441	$ 6,328	0.7628952	$ 1,440	$ 3,388	$ 4,828
5	$ 1,887	$ 4,441	$ 6,328	0.7129862	$ 1,346	$ 3,166	$ 4,512
6	$ 1,887	$ 4,441	$ 6,328	0.6663422	$ 1,258	$ 2,959	$ 4,217
7	$ 1,887	$ 4,441	$ 6,328	0.6227497	$ 1,175	$ 2,765	$ 3,941
8	$ 1,887	$ 4,441	$ 6,328	0.5820091	$ 1,098	$ 2,584	$ 3,683
9	$ 1,887	$ 4,441	$ 6,328	0.5439337	$ 1,027	$ 2,415	$ 3,442
10	$ 1,887	$ 4,441	$ 6,328	0.5083493	$ 959	$ 2,257	$ 3,217
	Total			7.0235815	$ 22,794	$ 53,999	$ 76,794
	Annualized Cost [c]				$ 3,245	$ 7,688	$ 10,934

[a] Total cost for coal and M/NM mine operators to review engineering and administrative controls for Year 1 (from Table IV-56). Total cost for coal and M/NM mine operators for each of Years 2-10 = $((q_s / a_s) \times c_s) + ((q_l / a_l) \times c_l)$, where q_s is the number of miners in small mines requiring retraining subsequent years final rule (from Table IV-51); a_s is the average number of miners per small mine (from Table IV-4); c_s is the cost per small mine of receiving engineering and administrative controls (from Table IV-56); q_l is the number of miners in large mines requiring retraining subsequent years final rule (from Table IV-51); a_l is the average number of miners per large mine (from Table IV-4); and c_l is the cost per large mine of receiving engineering and administrative controls (from Table IV-56).

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

c Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

The total annualized compliance cost associated with follow-up corrective measures when an STS is detected, as required under § 62.174 of the final rule, is summarized in Table IV-58.

TABLE IV-58: Summary of the Annualized Cost to Mine Operators Resulting from § 62.174 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Retraining	$ 3,035	$ 13,646	$ 10,069	$ 15,069	$ 41,818
Certification	$ 287	$ 1,545	$ 1,078	$ 1,938	$ 4,848
Review Controls	$ 1,764	$ 1,481	$ 6,106	$ 1,582	$ 10,934
Total	$ 5,086	$ 16,672	$ 17,253	$ 18,588	$ 57,599

*Source: Table IV-52; Table IV-53; Table IV-54; Table IV-55; Table IV-56; and Table IV-57.

8. § 62.175 Notification of Results

This section of the final rule is new and requires the mine operator to notify miners of the results and interpretation of any audiometric test, audiometric retest, or follow-up evaluation (required under § 62.173 of the final rule) within 10 working days of receiving the results. Such notification must include any finding of an STS or reportable hearing loss and the need and reasons for any further testing or evaluation, if applicable. In addition, the mine operator is required to report any work-related hearing losses to MSHA.

MSHA anticipates that it will take an average of 0.1 hours per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner and that it will take an average

of 0.08 hours per miner for a clerical worker to notify the miner. The associated photocopying expense is estimated to be $0.25 per miner notification.

The requirement to report any work-related hearing loss to MSHA is an existing one (under 30 CFR part 50) and, therefore, imposes no additional costs.

Table IV-59 provides MSHA's estimate of the cost to mine operators of notifying miners about the results of any audiometric test the first year after the final rule becomes effective. Table IV-60 provides MSHA's estimates of the cost of notifying miners about the results of any audiometric test over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-60 were calculated using a discount rate of 7%.

TABLE IV-59: The Cost of Notifying Miners of Audiometric Test Results in Accordance with § 62.175 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	9,613	$ 1.61	$ 15,476	1,710	$ 6.00	$ 10,258	$ 25,735
Large Coal Mines	51,145	$ 1.61	$ 82,343	892	$ 6.00	$ 5,351	$ 87,694
Total	60,757		$ 97,819	2,602		$ 15,609	$ 113,429
Small M/NM Mines	36,245	$ 1.61	$ 58,354	6,776	$ 5.30	$ 35,911	$ 94,265
Large M/NM Mines	64,518	$ 1.61	$ 103,874	1,098	$ 5.30	$ 5,820	$ 109,693
Total	100,763		$ 162,228	7,874		$ 41,730	$ 203,958

[a] Number of miners = the number of miners taking an audiometric test first year final rule (from Table IV-32).

[b] Cost per miner = (0.08 X $17) +$0.25, where 0.08 is the number of hours required per miner for a clerical worker to notify the miner of audiometric test results; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner for photocopying.

[c] The number of mines = the number of mines with miners exposed to noise levels at or above TWA_8 of 85 dBA (from Table IV-6).

[d] The cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours required, per mine, for a supervisor to instruct a clerical worker about notifying miners of their audiometric test results; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

TABLE IV-60: The Cost of Notifying Miners of Audiometric Test Results in Accordance with § 62.175 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 113,429	$ 203,958	$ 317,387	0.9345794	$ 106,008	$ 190,615	$ 296,623
2	$ 17,014	$ 30,594	$ 47,608	0.8734387	$ 14,861	$ 26,722	$ 41,583
3	$ 17,014	$ 30,594	$ 47,608	0.8162979	$ 13,889	$ 24,974	$ 38,862
4	$ 17,014	$ 30,594	$ 47,608	0.7628952	$ 12,980	$ 23,340	$ 36,320
5	$ 17,014	$ 30,594	$ 47,608	0.7129862	$ 12,131	$ 21,813	$ 33,944
6	$ 17,014	$ 30,594	$ 47,608	0.6663422	$ 11,337	$ 20,386	$ 31,723
7	$ 17,014	$ 30,594	$ 47,608	0.6227497	$ 10,596	$ 19,052	$ 29,648
8	$ 17,014	$ 30,594	$ 47,608	0.5820091	$ 9,902	$ 17,806	$ 27,708
9	$ 17,014	$ 30,594	$ 47,608	0.5439337	$ 9,255	$ 16,641	$ 25,896
10	$ 17,014	$ 30,594	$ 47,608	0.5083493	$ 8,649	$ 15,552	$ 24,202
	Total			7.0235815	$ 209,608	$ 376,901	$ 586,509
	Annualized Cost [c]				$ 29,843	$ 53,662	$ 83,506

[a] Total cost for coal and M/NM mine operators to notify miners of audiometric test results for Year 1 = t (from Table IV-59). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

Table IV-61 provides MSHA's estimate of the cost to mine operators of notifying miners about the results of any audiometric retest the first year after the final rule becomes effective. Table IV-62 provides MSHA's estimates of the cost of notifying miners about the results of any audiometric retest over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-62 were calculated using a discount rate of 7%.

TABLE IV-61: The Cost of Notifying Miners of Audiometric Retest Results in Accordance with § 62.175 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	961	$ 1.61	$ 1,548	161	$ 6.00	$ 965	$ 2,513
Large Coal Mines	5,114	$ 1.61	$ 8,234	71	$ 6.00	$ 423	$ 8,658
Total	6,076		$ 9,782	231		$ 1,389	$ 11,171
Small M/NM Mines	3,624	$ 1.61	$ 5,835	644	$ 5.30	$ 3,412	$ 9,247
Large M/NM Mines	6,452	$ 1.61	$ 10,387	88	$ 5.30	$ 466	$ 10,853
Total	10,076		$ 16,223	732		$ 3,877	$ 20,100

[a] Number of miners = the number of miners taking an audiometric retest first year final rule (from Table IV-45).

[b] Cost per miner = (0.08 X $17) +$0.25, where 0.08 is the number of hours required per miner for a clerical worker to notify the miner of audiometric retest results; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner for photocopying.

[c] The number of mines = n/a, where n is the number of miners taking an audiometric retest first year final rule (from Table IV-37), and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] The cost per mine = 0.1 X($17 + w_s), where 0.1 is the number of hours required, per mine, for a supervisor to instruct a clerical worker about notifying miners of their audiometric retest results; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

TABLE IV-62: The Cost of Notifying Miners of Audiometric Retest Results in Accordance with § 62.175 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 11,171	$ 20,100	$ 31,271	0.9345794	$ 10,440	$ 18,785	$ 29,225
2	$ 1,676	$ 3,015	$ 4,691	0.8734387	$ 1,464	$ 2,633	$ 4,097
3	$ 1,676	$ 3,015	$ 4,691	0.8162979	$ 1,368	$ 2,461	$ 3,829
4	$ 1,676	$ 3,015	$ 4,691	0.7628952	$ 1,278	$ 2,300	$ 3,578
5	$ 1,676	$ 3,015	$ 4,691	0.7129862	$ 1,195	$ 2,150	$ 3,344
6	$ 1,676	$ 3,015	$ 4,691	0.6663422	$ 1,117	$ 2,009	$ 3,126
7	$ 1,676	$ 3,015	$ 4,691	0.6227497	$ 1,043	$ 1,878	$ 2,921
8	$ 1,676	$ 3,015	$ 4,691	0.5820091	$ 975	$ 1,755	$ 2,730
9	$ 1,676	$ 3,015	$ 4,691	0.5439337	$ 911	$ 1,640	$ 2,551
10	$ 1,676	$ 3,015	$ 4,691	0.5083493	$ 852	$ 1,533	$ 2,384
	Total			7.0235815	$ 20,643	$ 37,143	$ 57,786
	Annualized Cost [c]				$ 2,939	$ 5,288	$ 8,227

[a] Total cost for coal and M/NM mine operators to notify miners of audiometric retest results for Year 1 = t (from Table IV-61). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

Table IV-63 provides MSHA's estimate of the cost to mine operators of notifying miners about the results of any follow-up evaluation the first year after the final rule becomes effective. Table IV-64 provides MSHA's estimates of the cost of notifying miners about the results of any follow-up evaluation over a 10-year period, from Year 1 to Year 10. The present value of the costs for Years 1-10 and the annualized cost in Table IV-64 were calculated using a discount rate of 7%.

TABLE IV-63: The Cost of Notifying Miners of the Results of Follow-up Examinations in Accordance with § 62.175 of the Final Rule (Year 1)

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	51	$ 1.61	$ 81	8	$ 6.00	$ 51	$ 132
Large Coal Mines	320	$ 1.61	$ 516	4	$ 6.00	$ 27	$ 542
Total	371		$ 597	13		$ 77	$ 675
Small M/NM Mines	191	$ 1.61	$ 307	34	$ 5.30	$ 180	$ 487
Large M/NM Mines	403	$ 1.61	$ 649	5	$ 5.30	$ 29	$ 678
Total	594		$ 956	39		$ 209	$ 1,165

[a] Number of miners = the number of miners requiring follow-up examinations first year final rule (from Table IV-45).

[b] Cost per miner = (0.08 X $17) + $0.25, where 0.08 is the number of hours required per miner for a clerical worker to notify the miner of follow-up examination results; $17 is the hourly wage rate for a clerical worker; and $0.25 is the cost per miner for photocopying.

[c] The number of mines = n/a, where n is the number of miners taking a follow-up examination first year final rule (from Table IV-45), and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] The cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours required, per mine, for a supervisor to instruct a clerical worker about notifying miners of their follow-up examination results; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

TABLE IV-64: The Cost of Notifying Miners of the Results of Follow-up Examinations in Accordance with § 62.175 of the Final Rule (Years 1-10)

Year	Total Cost for Coal Mines [a]	Total Cost for M/NM Mines [a]	Total Costs	Discounted Present Value Factor [b]	Coal Mines Discounted Present Value	M/NM Mines Discounted Present Value	Total Costs Discounted Present Value
1	$ 675	$ 1,165	$ 1,840	0.9345794	$ 631	$ 1,089	$ 1,719
2	$ 101	$ 175	$ 276	0.8734387	$ 88	$ 153	$ 241
3	$ 101	$ 175	$ 276	0.8162979	$ 83	$ 143	$ 225
4	$ 101	$ 175	$ 276	0.7628952	$ 77	$ 133	$ 211
5	$ 101	$ 175	$ 276	0.7129862	$ 72	$ 125	$ 197
6	$ 101	$ 175	$ 276	0.6663422	$ 67	$ 116	$ 184
7	$ 101	$ 175	$ 276	0.6227497	$ 63	$ 109	$ 172
8	$ 101	$ 175	$ 276	0.5820091	$ 59	$ 102	$ 161
9	$ 101	$ 175	$ 276	0.5439337	$ 55	$ 95	$ 150
10	$ 101	$ 175	$ 276	0.5083493	$ 51	$ 89	$ 140
	Total			7.0235815	$ 1,247	$ 2,153	$ 3,400
	Annualized Cost [c]				$ 177	$ 307	$ 484

[a] Total cost for coal and M/NM mine operators to notify miners of follow-up examination results for Year 1 = t (from Table IV-63). Total cost for coal and M/NM mine operators for each of Years 2-10 = 15% X t.

[b] Discounted present value factor = $1 / (1+i)^n$, where i, the discount rate, is 0.07; and n is the n^{th} year after the rule becomes effective.

[c] Annualized cost = v / d, where v is the total discounted present value and d is the sum of the discounted present value factors. d also equals 1/a, where a is the annualization factor.

The total annualized compliance cost associated with notifying miners of the results of any audiometric test, audiometric retest, or follow-up evaluation, as required under § 62.175 of the final rule, is summarized in Table IV-65.

TABLE IV-65: The Cost of Notifying Miners of the Results of Audiometric Tests, Audiometric Retests, and Follow-up Examinations in Accordance with § 62.175 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Notify Results of Audiometric Tests	$ 6,771	$ 23,073	$ 24,801	$ 28,861	$ 83,506
Notify Results of Audiometric Retests	$ 661	$ 2,278	$ 2,433	$ 2,855	$ 8,227
Notify Results of Follow-up Examinations	$ 35	$ 143	$ 128	$ 178	$ 484
Total	$ 7,467	$ 25,493	$ 27,362	$ 31,895	$ 92,217

*Source: Table IV-59; Table IV-60; Table IV-61; Table IV-62; Table IV-63; and Table IV-64.

9. § 62.180 Training

Within 30 days of a miner's enrollment into an HCP, the mine operator must provide noise training as specified in § 62.180 of the final rule. Training must be given every 12 months thereafter if noise exposure continues to equal or exceed the action level. The training is to include information about the effects of noise exposure on hearing; the purpose, fitting, use, and maintenance of hearing protectors; the value of audiometric

testing; and several other related items. After completion of any noise training, the mine operator must certify the date and type of training given to each miner and maintain the most recent certification. These records may be maintained electronically.

All miners exposed to noise levels at or above the action level——a TWA_8 of 85 dBA——must receive the noise training. At the public hearings, however, many large mine operators stated that they currently provide noise training. For the final REA, MSHA has, therefore, adjusted the number of miners taking noise training in response to the final rule by assuming that 10% of large mine operators already provide annual training for their employees.

MSHA estimates that each miner will receive approximately 0.35 hours of noise training. MSHA anticipates that the mine operator or mine supervisor will instruct the miners (i.e., the rule is flexible in this regard and does not require mine operators to procure the services of a special instructor). MSHA expects that an average of three sessions will be required to accommodate the workforce noise training at large mines, while one session will be sufficient for small mines.

Table IV-66 provides MSHA’s estimate of the annual cost to mine operators of providing noise training to miners.

TABLE IV-66: The Annual Cost to Mine Operators of Providing Noise Training in Accordance with § 62.180 of the Final Rule

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	10,215	$ 9.10	$ 92,955	1,710	$ 15.05	$ 25,731	$ 118,686
Large Coal Mines	58,181	$ 9.10	$ 529,450	803	$ 45.15	$ 36,241	$ 565,691
Total	68,396		$ 622,406	2,512		$ 61,972	$ 684,378
Small M/NM Mines	38,153	$ 8.05	$ 307,128	6,776	$ 12.60	$ 85,372	$ 392,501
Large M/NM Mines	72,583	$ 8.05	$ 584,289	988	$ 37.80	$ 37,356	$ 621,645
Total	110,735		$ 891,418	7,764		$ 122,728	$ 1,014,146

[a] Number of miners = n for small mines, where n is the number of miners with noise exposures that equal or exceed the action level of TWA_8 of 85 dBA (from Table IV-6). The number of miners = 0.9 X n for large mines.

[b] Cost per miner = 0.35 X w_m, where 0.35 is the number of hours of noise training per miner and w_m is the hourly wage rate for a miner and w_m=$26 for a coal miner and w_m=$23 for a metal/nonmetal miner.

[c] The number of mines = m for small mines, where m is the number of mines with miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6). The number of mines = 0.9 X m for large mines.

[d] The cost per mine = 0.35 X w_s X r, where 0.35 is the number of hours a supervisor needs to give a session of noise training to miners; w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor; and r is the number of sessions required and r=1 for a small mine and r=3 for a large mine.

MSHA is not aware of a training certificate component for most existing HCPs. MSHA, therefore, did not make any adjustments to account for mines which already have training as part of their existing HCPs. MSHA estimates that it will take

MSHA is not aware of a training certificate component for most existing HCPs. MSHA, therefore, did not make any adjustments to account for mines which already have training as part of their existing HCPs. MSHA estimates that it will take 0.1 hours per mine for the mine supervisor to give instructions to a clerical worker about preparing and filing a training certificate. The Agency further estimates that it will take 0.05 hours per miner for a clerical worker to prepare and file a training certification and that there will be associated photocopying expenses of $0.25 per miner.

Table IV-67 provides MSHA's estimate of the annual cost to mine operators of preparing and filing a noise training certificate.

TABLE IV-67: The Annual Cost to Mine Operators of Preparing and Filing a Noise Training Certificate in Accordance with § 62.180 of the Final Rule

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	10,215	$ 1.10	$ 11,236	1,710	$ 6.00	$ 10,258	$ 21,495
Large Coal Mines	64,646	$ 1.10	$ 71,111	892	$ 6.00	$ 5,351	$ 76,462
Total	74,861		$ 82,347	2,602		$ 15,609	$ 97,956
Small M/NM Mines	38,153	$ 1.10	$ 41,968	6,776	$ 5.30	$ 35,911	$ 77,878
Large M/NM Mines	80,647	$ 1.10	$ 88,712	1,098	$ 5.30	$ 5,820	$ 94,532
Total	118,800		$ 130,680	7,874		$ 41,730	$ 172,410

[a] Number of miners = the number of miners with noise exposures that equal or exceed the action level of TWA_8 of 85 dBA (from Table IV-6).

[b] Cost per miner = (0.05 X $17) + $0.25, where 0.05 is the number of hours, per miner, a clerical worker needs to prepare and file a noise training certificate; $17 is the hourly wage rate for a clerical worker; and $0.25 is associated photocopying expense per miner.

[c] The number of mines = the number of mines with miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6).

[d] The cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours needed, per miner, for a mine supervisor to give instructions to a clerical worker about preparing and filing a noise training certificate; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

The total annual cost associated with § 62.180 of the final rule is summarized in Table IV-68.

TABLE IV-68: Summary of the Annual Cost to Mine Operators Associated with § 62.180 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Noise Training	$ 118,686	$ 565,691	$ 392,501	$ 621,645	$ 1,698,524
Noise Certificate	$ 21,495	$ 76,462	$ 77,878	$ 94,532	$ 270,366
Total	$ 140,181	$ 642,153	$ 470,379	$ 716,177	$ 1,968,890

*Source: Table IV-66 and Table IV-67.

10. § 62.190 Access to and Transfer of Records

The final rule's provision on access to records is new and requires the mine operator to provide access to records to authorized representatives of the Secretaries of Labor and Health and Human Services (HHS), and upon request, to the miner or the miner's designee. MSHA expects that providing authorized representatives of the Secretaries of Labor and HHS with access to all records required under this part will not impose any additional burden on mine operators. Such access is authorized under Section 103 of the Mine Act and is already part of routine MSHA inspections.

MSHA estimates that 1% of working miners (or their designees) will request access to records per year. In addition, MSHA assumes that all miners, upon termination of employment, will request a copy of their records. For metal/nonmetal mines,

the miner attrition rate is 11.4% for small mines and 6.4% for large mines. The attrition rate for coal mines is 5.8% for small mines and 1.9% for large mines.

Table IV-69 provides MSHA's estimate of the number of miners requesting access to their records each year.

TABLE IV-69: The Number of Miners Requesting Access to Their Records under § 62.190 of the Final Rule

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Number of Employed Miner Requests [a]	102	646	382	806	1,937
Number of Miner Requests after Job Termination [b]	592	1,228	4,349	5,161	11,332
Total	695	1,875	4,731	5,968	13,268

[a] The number of employed miner requests = 0.01 X n, where n is the number of miners with noise exposures at or above the action level of TWA_8 of 85 dBA (from Table IV-6).

[b] The number of miner requests after job termination = a X n, where a is the miner attrition rate and a=0.058 for small coal mines, 0.019 for large coal mines, 0.114 for small M/NM mines, and 0.064 for large M/NM mines.

MSHA anticipates that it will take an average of 0.1 hours per mine for a mine supervisor to give instructions to a clerical worker about locating and photocopying miners' records required under this part and that it will take 0.15 hours of clerical time to locate and photocopy each miner's records. The associated photocopying expense is estimated to be $0.25 per miner.

Table IV-70 provides MSHA’s estimate of the annual cost to mine operators of providing access to records under § 62.190 of the final rule.

TABLE IV-70: The Annual Cost to Mine Operators of Providing Access to Records in Accordance with § 62.190 of the Final Rule

Size	# of Miners [a]	Cost per Miner[b]	Cost Related to # of Miners	# of Mines [c]	Cost per Mine[d]	Cost Related to # of Mines	Total Costs
Small Coal Mines	695	$ 2.80	$ 1,945	116	$ 6.00	$ 698	$ 2,642
Large Coal Mines	1,875	$ 2.80	$ 5,249	26	$ 6.00	$ 155	$ 5,404
Total	2,569		$ 7,194	142		$ 853	$ 8,047
Small M/NM Mines	4,731	$ 2.80	$ 13,247	840	$ 5.30	$ 4,453	$ 17,699
Large M/NM Mines	5,968	$ 2.80	$ 16,710	81	$ 5.30	$ 431	$ 17,141
Total	10,699		$ 29,957	921		$ 4,884	$ 34,840

[a] Number of miners = the number of miners requesting access to their records (from Table IV-69).

[b] Cost per miner = (0.15 X $17) + $0.25, where 0.15 is the number of hours of clerical time required to locate and photocopy a miner's record; $17 is the hourly wage rate for a clerical worker; and $0.25 is the photocopying expense per miner.

[c] Number of mines = n/a, where n is the number of miners requesting access to their records (from Table IV-69) and a is the average number of miners per mine of that type and size (from Table IV-4).

[d] The cost per mine = 0.1 X ($17 + w_s), where 0.1 is the number of hours required, per mine, for a supervisor to instruct a clerical worker about locating and photocopying miners' records; $17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=$43 for a coal mine supervisor and w_s=$36 for a metal/nonmetal mine supervisor.

Under § 62.190 of the final rule, the mine operator also must transfer all records required by this part to the successor mine operator. The mine operator is required to notify miners of their right to access records if no successor operator exists.

Based upon data compiled by the U.S. Department of the

Under § 62.190 of the final rule, the mine operator also must transfer all records required by this part to the successor mine operator. The mine operator is required to notify miners of their right to access records if no successor operator exists.

Based upon data compiled by the U.S. Department of the Interior, former Bureau of Mines, MSHA estimates that the mine closure rate is approximately 5.8% for small metal/nonmetal mines, 1.0% for large metal/nonmetal mines, 12.5% for small coal mines, and 1.9% for large coal mines.

MSHA estimates that it will take 0.1 hours for a mine supervisor to give instructions to a clerical worker about transferring all records required under this part. MSHA further estimates that compiling the records will take approximately 0.5 hours of a clerical worker's time at a small mine and approximately 1 hour of a clerical worker's time at a large mine.

Table IV-71 provides MSHA's estimate of the cost to mine operators of transferring records as required under § 62.190 of the final rule.

TABLE IV-71: The Annual Cost to Mine Operators of Transferring Records as Required under § 62.190 of the Final Rule

Size	Coal			Metal/Nonmetal			Total Costs for All Mines
	# of Mines [a]	Cost per Mine [b]	Total Cost	# of Mines [a]	Cost per Mine [b]	Total Cost	
Small	214	$ 14.50	$ 3,099	393	$ 13.80	$ 5,423	$ 8,522
Large	17	$ 23.00	$ 390	11	$ 22.30	$ 245	$ 635
Total	231		$ 3,489	404		$ 5,668	$ 9,157

[a] Number of mines = c X n, where n is the number of mines with miners exposed to noise levels at or above the action level of TWA_8 of 85 dBA (from Table IV-6) and c is the closure rate for mines and c=0.125 for small mines, 0.019 for large coal mines, 0.058 for small M/NM mines, and 0.01 for large M/NM mines.

[b] Cost per mine = $(0.1X(\$17 + w_s)) + (h_c X \$17)$, where 0.1 is the number of hours needed for a mine supervisor to give instructions to a clerical worker about transferring records; \$17 is the hourly wage rate for a clerical worker; and w_s is the hourly wage rate for a mine supervisor and w_s=\$43 for a coal mine supervisor and w_s=\$36 for a metal/nonmetal mine supervisor; and h_c is the number of hours a clerical worker needs to compile all the miners' records and h_c=0.5 for a small mine and h_c=1.0 for a large mine.

The total annual cost associated with § 62.190 of the final rule is summarized in Table IV-72.

TABLE IV-72: Summary of the Annual Cost to Mine Operators Associated with § 62.190 of the Final Rule*

Task	Coal		Metal/Nonmetal		Total
	Small	Large	Small	Large	
Record access	$ 2,642	$ 5,404	$ 17,699	$ 17,141	$ 42,887
Record transfer	$ 3,099	$ 390	$ 5,423	$ 245	$ 9,157
Total	$ 5,741	$ 5,794	$ 23,123	$ 17,386	$ 52,044

*Source: Table IV-70 and Table IV-71.

E. FEASIBILITY

As discussed in detail in Part VI of the preamble of the final rule, MSHA has concluded that the requirements of the final rule are both technologically and economically feasible for the mining industry as a whole.

Prior to the Advance Notice of Proposed Rulemaking (ANPR) on noise exposure, MSHA conducted an examination of the feasibility of engineering noise controls. This initial study was performed for metal and nonmetal mines. The study revealed that engineering controls such as retrofitting equipment and the use of noise damping fields will be economically and technologically feasible on specific types of equipment. The study was organized to address feasibility per equipment type.

For haulage equipment (shuttle cars, haul trucks, etc.), draglines, shovels, and portable crushers, the MSHA study concluded that engineering controls can be added to reduce noise exposure. For each type of equipment, a 3 to 5 dB reduction was estimated as the average reduction achieved. In addition, the study suggested that such changes will be economically feasible insofar as the controls cost from $700 to $1,000 per machine. This figure can be amortized over the life of the equipment, and the annualized cost is small.

After the proposal was published, MSHA again considered the feasibility of engineering controls and the comments received on feasibility. While feasible engineering controls generally exist to reduce noise exposures in accordance with this final rule, MSHA recognizes that in a few instances, feasible engineering controls may not exist for specific types of equipment, such as channel burners. MSHA will work with mine operators to identify feasible engineering controls applicable to their individual operations to reduce noise exposures in accordance with the final rule.

MSHA anticipates that the most expensive engineering control is the retrofitting of machinery with an acoustically-treated cab, which could cost up to $50,000. In examining this option, MSHA expects that mine operators will consider the noise reduction of the control so as to meet the PEL. The age and

remaining productive life of the equipment will also be factors. In situations where a cab is not feasible, MSHA anticipates the use of less costly (and less effective) controls, including the placement of acoustic materials on the firewall and in the operator's compartment, or the addition of a muffler.

The most convincing evidence that the final rule will be economically feasible for the mining industry as a whole is the fact that the total cost of the final rule borne by the mining industry, $8.7 million annually, is only 0.01 percent of annual industry revenues of approximately $59.7 billion. Nevertheless, MSHA recognizes that, in a few cases, individual mine operators, particularly small operators, may have difficulty in achieving full compliance with the final rule immediately because of a lack of financial resources to purchase and install engineering controls. However, ultimate compliance with the final rule is expected to be achieved.

As further discussed in the preamble, MSHA considered some additional regulatory alternatives that would require even more extensive use of engineering controls. MSHA believes that these alternatives would not be feasible at this time for the mining industry.

V. REGULATORY FLEXIBILITY CERTIFICATION

A. INTRODUCTION

Pursuant to the Regulatory Flexibility Act (RFA) of 1980, MSHA has analyzed the impact of this rule on small businesses. Further, MSHA certifies that this final rule will not have a significant economic impact on a substantial number of small entities. Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the RFA, MSHA must include in the final rule a factual basis for this certification. If the final rule does have a significant economic impact on a substantial number of small entities, then the Agency must develop a regulatory flexibility analysis.

Based upon MSHA's analysis, the Agency has determined that the final rule will not have a significant economic impact on a substantial number of small coal and metal/nonmetal mine operators, and has so certified to the Small Business Administration (SBA). The factual basis for this certification will be included in the preamble to the final rule for publication in the Federal Register. To facilitate public participation in the rulemaking process, MSHA will mail a copy of the final rule, including the preamble, and regulatory flexibility certification statement, to every coal and metal/nonmetal mine operator.

B. DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a rule on small entities, MSHA must use the SBA definition for a small entity or, after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the Federal Register for notice and comment. MSHA has not taken such an action, and hence is required to use the SBA definition.

The SBA defines a small entity in the mining industry as an establishment with 500 employees or fewer (13 CFR 121.201). Almost all mines fall into this category and therefore can be viewed as sharing the special regulatory concerns which the RFA was designed to address.

The Agency is concerned, however, that looking only at the impacts of the final rule on all mines does not provide the Agency with an informed basis on which to make decisions. Traditionally, the Agency has also looked at the impacts of its rules on what the mining community refers to as "small mines": those with fewer than 20 miners. The way these small mines perform mining operations is generally recognized as being different from the way other mines operate.

This analysis complies with the legal requirements of the RFA for an analysis of the impacts on "small entities" while continuing MSHA's traditional look at "small mines." In

concluding that it can certify that the final rule has no significant impact on a substantial number of small entities, MSHA has determined that this is the case both for coal mines and metal/nonmetal mines with 500 or fewer employees and for coal mines and metal/nonmetal mines with fewer than 20 employees.

C. FACTUAL BASIS FOR CERTIFICATION

General approach: The Agency's analysis of impacts on "small entities" and "small mines" begins with a "screening" analysis. The screening compares the estimated compliance costs of the final rule for small mine operators in the affected sector to the estimated revenues for that sector. When estimated compliance costs are less than 1 percent of estimated revenues (for the size categories considered), the Agency believes it is generally appropriate to conclude that there is no significant impact on a substantial number of small entities. When estimated compliance costs approach or exceed 1 percent of revenue, it tends to indicate that further analysis may be warranted.

Derivation of costs and revenues: In this final rule, because the compliance costs must be absorbed by coal and metal/nonmetal mines, the agency decided to focus its attention on the relationship between costs and revenues for coal and metal/nonmetal mine sectors as two independent entities, rather than combining them into one category.

The compliance costs for this analysis were presented in Chapter IV of this REA, along with an explanation of how they were derived. In estimating compliance costs, different assumptions often had to be made for mines of different sizes in order to account for differences in mining operations.

In determining revenues for coal mines, MSHA multiplied coal production data (in tons) for coal mines in specific size categories (reported to MSHA quarterly) by $18.14 per ton (the 1997 average price per ton).[34] With respect to the metal and nonmetal industry, the Agency took the total revenue generated by the metal/nonmetal industry ($40 billion)[35] and divided it by the total number of employee hours to arrive at the average revenue per hour of employee production ($117.73). MSHA then took the $117.73 and multiplied it by employee hours in specific size categories to arrive at estimated revenues.

Results of screening analysis: As shown in Table V-1, for coal mine operators with fewer than 20 employees, the estimated yearly cost of the final rule is $400 per mine operator, and estimated yearly costs as a percentage of revenues are 0.08 percent. As shown in Table V-2, for coal mine operators with 500 or fewer employees, the estimated yearly cost of the final rule is $508 per mine operator.

Table V-1: The Impact of Final Rule on the Coal Mining Industry*

Mine Type	Estimated Costs	Estimated Revenue	Estimated Cost per Mine	Cost as % of Revenue
Small (<20)	$ 603,941	$ 767,307,869	$ 400	0.08%
Large (≥ 20)	$ 763,112	$18,964,691,818	$ 727	0.00%

*Source: Preliminary Data 1997 from CM441 and Department of Energy/Energy Information Agency. Annual Energy Review 1997. POE/EIA-038497. July 1998. P.187.

Table V-2: The Impact of Final Rule on the Coal Mining Industry*

Mine Type	Estimated Costs	Estimated Revenue	Estimated Cost per Mine	Cost as % of Revenue
Small (≤ 500)	$ 1,296,461	$19,038,974,646	$ 508	0.01%
Large (< 500)	$ 70,592	$ 693,025,041	$ 6,403	0.01%

*Source: Preliminary Data 1997 from CM441 and Department of Energy/Energy Information Agency. Annual Energy Review 1997. POE/EIA-038497. July 1998. P.187.

As shown in Table V-3, for metal/nonmetal mines with fewer than 20 employees, the estimated yearly cost of the final rule is $460 per mine operator, and estimated costs as a percentage of revenues are 0.04 percent. As shown in Table V-4, for metal/nonmetal mine operators with 500 or fewer employees, the estimated yearly cost is $634 per mine operator, and estimated costs as a percentage of revenues are 0.02 percent.

Table V-3: The Impact of Final Rule on the Metal/Nonmetal Mining Industry*

Mine Type	Estimated Costs	Estimated Revenue	Estimated Cost per Mine	Cost as % of Revenue
Small (<20)	$ 4,321,282	$10,651,022,009	$ 460	0.04%
Large (≥ 20)	$ 3,056,036	$27,348,977,991	$ 1,945	0.01%

*Source: Preliminary Data 1997 from CM441 and Department of Interior, Bureau of Mines, Mineral Commodities Summaries 1996, January 1996, pp. 3 and 6.

Table V-4: The Impact of Final Rule on the Metal/Nonmetal Mining Industry*

Mine Type	Estimated Costs	Estimated Revenue	Estimated Cost per Mine	Cost as % of Revenue
Small (≤ 500)	$ 6,922,273	$32,809,662,843	$ 634	0.02%
Large (< 500)	$ 455,044	$ 5,190,337,157	$ 14,931	0.01%

*Source: Preliminary Data 1997 from CM441 and Department of Interior, Bureau of Mines, Mineral Commodities Summaries 1996, January 1996, pp. 3 and 6.

In all cases, the cost of complying with the final rule is less than one percent of revenues, well below the level suggesting that the final rule might have a significant impact on a substantial number of small entities. Accordingly, MSHA has certified that there is no such impact on small coal mines or small metal/nonmetal mines.

As required under the law, MSHA is complying with its obligation to consult with the Chief Counsel for Advocacy on this final rule, and on the Agency's certification of no significant impact in coal and metal/nonmetal mining sectors. Consistent with agency practice, notes of any meetings with the Chief Counsel's office on this rule, or any written communications, will be placed in the rulemaking record. The Agency will continue to consult with the Chief Counsel's office as the rulemaking process proceeds.

Regulatory alternatives considered. The limited impact of the final rule on small mines, regardless of size definition, reflect decisions by MSHA not to require more costly regulatory alternatives. In considering regulatory alternatives for small mines, MSHA must observe the requirements of its authorizing statute. Section 101(a)(6)(A) of the Mine Act requires the Secretary to set standards which most adequately assure, on the basis of the best available evidence, that no miner will suffer material impairment of health over his/her working lifetime. In addition, the Mine Act requires that the Secretary, when promulgating mandatory standards pertaining to toxic materials or harmful physical agents, consider other factors, such as the latest scientific data in the field, the feasibility of the standard and experience gained under the Act and other health and safety laws. Thus, the Mine Act requires that the Secretary, in

promulgating a standard, attain the highest degree of health and safety protection for the miner, based on the “best available evidence,” with feasibility as a consideration.

As a result of this statutory requirement, MSHA seriously considered two alternatives that would have significantly increased costs for small mine operators — lowering the PEL to a TWA_8 of 85 dBA, and lowering the exchange rate to 3 dB. In both cases, the scientific evidence in favor of these approaches was strong. However, commenters offered divergent views on the alternatives. In both cases, for the purpose of this final rule, MSHA has concluded that it is not feasible for the mining industry to accomplish these more protective approaches. The impact of these approaches on small mine operators was an important consideration in this regard.

Further, MSHA proposed using an 80 dBA threshold for the PEL. If the Agency had done this, then the number of mines with exposure levels at or above the PEL would have increased substantially. Accordingly, with more mines above this level, the total cost of compliance would have been much higher. The proposed change in the threshold was met with resistance from the mining industry. Several commenters believed that the current 90 dBA threshold was sufficient for achieving adequate health standards and was compatible with OSHA’s HCP. For these reasons, the final rule includes the existing threshold for the PEL.

Another alternative MSHA proposed was audiometric testing for overexposed miners; under the proposal, the mine operator would have had to make certain that overexposed miners take the exam. Several miners and mine operators expressed concerns at the public hearings and in submitted comments. Miners were concerned about confidentiality as well as possible employment repercussions for miners who are found to have serious hearing problems. Furthermore, mine operators stated that they could not assure or "force" miners to take the exams. MSHA considered these concerns and revised the audiometric testing standard so that it will be voluntary. In this regard, it is also compatible with OSHA's HCP.

In addition, MSHA proposed a provision which would have prevented mine operators from using hearing protectors as a substitute for the 14 hour quiet period of workplace noise prior to an audiogram. Mine operators had stated that they could not, without substantial burden to production and management, meet this requirement. Some noted that in cases in which the audiometric testing cannot be scheduled on a day after a nonwork day, the only way to ensure a 14 hour quiet period of workplace noise was to pay the miner not to work. MSHA considered these comments and decided against this proposed requirement. Under the final rule, mine operators may use hearing protectors as a

substitute for the quiet period. This is compatible with OSHA's HCP.

Another regulatory proposal which MSHA revised was the requirement for mine operators to give miners a copy of all their records relating to this standard when those miners terminate employment. Mine operators stated that this was an unnecessary requirement which generated too much paperwork burden and that miners may not even want a copy. MSHA decided to revise the proposal to require mine operators to give copies upon termination only if requested to do so.

In accordance with the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA carefully considered all of the requirements, in addition to various alternatives, to assure that the final rule would provide the least burdensome impact necessary to promote miner safety. MSHA believes that it has complied with the SBREFA amendments.

Part IV of the proposed rule's preamble contained a full discussion of MSHA's preliminary conclusions about regulatory alternatives. The public was invited to suggest other alternatives for consideration.

Other relevant matters. In accordance with the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA is taking actions to minimize the compliance burden on small mines. The final effective date of the rule will be a full year after

final promulgation, to provide adequate time for small mines to achieve compliance and for MSHA to brief the mining public and its own employees about the rule’s requirements. Also, MSHA will mail a copy of the final rule to every mine operator. The Agency has committed itself to issuing a compliance guide for all mines; MSHA believes that compliance workshops or other approaches will be valuable, and the Agency is amenable to holding such workshops.

VI. THE UNFUNDED MANDATES REFORM ACT OF 1995 AND OTHER REGULATORY CONSIDERATIONS

A. THE UNFUNDED MANDATES REFORM ACT

MSHA has determined that, for purposes of § 202 of the Unfunded Mandates Reform Act of 1995, this final rule does not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments in the aggregate of more than $100 million, or increased expenditures by the private sector of more than $100 million. Moreover, the Agency has determined that, for purposes of § 203 of that Act, this proposed rule does not significantly or uniquely affect small governments.

1. Background

The Unfunded Mandates Reform Act was enacted in 1995. While much of the Act is designed to assist the Congress in determining whether its actions will impose costly new mandates on State, local, and tribal governments, the Act also includes requirements to assist Federal agencies to make this same determination with respect to regulatory actions.

2. Analysis

Based on the analysis in MSHA's Regulatory Economic Analysis, the coal and metal/nonmetal mining industries will incur compliance costs associated with this final rule of approximately $8.7 million per year. Accordingly, there is no need for further analysis under § 202 of the Unfunded Mandates Reform Act.

MSHA has concluded that small governmental entities are not significantly or uniquely impacted by the final regulation. The final rule will impact approximately 15,298 coal and metal and nonmetal mining operations including independent contractors; however, increased costs will be incurred only by those operations (approximately 10,476 mines) where noise exposures equal or exceed the action level. Of this total, MSHA estimates that approximately 185 small metal/nonmetal operations (with fewer than 20 employees) and 2 large metal/nonmetal operations (with 20 or more employees) are run by state, local, or tribal governments and could potentially be impacted by this rule.[36] Because MSHA does not have information about how many of these government-owned mines equal or exceed the action level of a TWA_8 of 85 dBA, MSHA cannot determine the exact impact of the final rule on these entities. However, even if all of these mines have noise exposures at or above a TWA_8 of 85 dBA, MSHA estimates that compliance costs per mine would average only about $645 per year. In the long run, the compliance costs for these entities are

expected to be partially offset by reduced workers' compensation costs associated with a reduction in the number of cases of noise-induced hearing impairment.

When MSHA issued the proposed rule, the Agency affirmatively sought input from any state, local, and tribal government which might be affected by the noise rulemaking. Included were state and local governmental entities who operate sand and gravel mines in the construction and repair of highways and roads. MSHA mailed a copy of the proposed rule to those entities. No state, local or tribal government entity commented on the proposed rule. When the final rule is published, MSHA will mail a copy of it to these 155 entities.

B. EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

In accordance with Executive Order 13045, MSHA has evaluated the environmental health and safety effects of the rule on children. The Agency has determined that the rule will have no adverse effects on children.

C. ENVIRONMENTAL ASSESSMENT

The final noise rule has been reviewed 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 of Environmental Quality (CEQ) (40 CFR part 1500), and the Department of Labor's NEPA procedures (29 CFR part 11). As a result of this review, MSHA has concluded that the rule will not

have significant environmental impacts. MSHA believes that the final rule will indirectly aid the environment since many of the engineering controls which control noise, such as mufflers and curtains, also aid in controlling environmental pollutants.

D. EXECUTIVE ORDER 13084: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

MSHA certifies that the final rule does not impose substantial direct compliance costs on Indian tribal governments. Further, MSHA provided the public, including Indian tribal governments which operate mines, the opportunity to comment on the proposal and to participate in the public hearing process. No Indian tribal government applied for a waiver or commented on the proposal.

VII. PAPERWORK REDUCTION ACT OF 1995

The final rule contains information collection requirements in §§ 62.110 to 62.130, 62.170 to 62.175, 62.180, and 62.190. Those required to provide the information are mine operators and individuals who are paid to perform tasks for the mine operator (e.g., physicians reporting the results of audiograms to the mine operator). Table VII-1 and Table VII-2 provide, by section, the change in paperwork requirements for Year 1 and for each succeeding year, respectively.

Table IV-1: Summary of Net Information Collection Burden Hours in Year 1

Section	Paperwork Requirements and Associated Tasks	Coal Mines		M/NM Mines		Total
		Small	Large	Small	Large	
62.110 to 62.130	Evaluate noise exposure; notify miners, prepare, post, and distribute administrative controls; and permit observation of monitoring.	(7,988)	(50,666)	14,605	12,579	(31,471)
62.170	Perform audiograms; and notify miners to appear for testing and of need to avoid high noise levels.	940	4,181	3,577	5,271	13,969
62.171	Compile an audiometric test record; and obtain evidence.	1,021	4,616	3,882	5,820	15,339
62.172	Provide information and audiometric test record; and perform audiometric retests.	1,413	4,374	5,474	5,513	16,774
62.173	Perform otological evaluations; and provide information and notice.	7	27	29	34	98
62.174	Prepare a retraining certification; and review effectiveness of engineering and administrative controls.	105	334	407	420	1,266
62.175	Inform miners of test results and STS.	1,038	4,623	3,950	5,829	15,440
62.180	Prepare and file a training certificate.	1,280	4,165	4,957	5,180	15,581
62.190	Provide access to, and transfer, records.	244	303	1,027	915	2,489
Total		(1,941)	(28,045)	37,909	41,561	49,484

TABLE VII-2: Summary of Net Information Collection Burden Hours for After Year 1

Section	Paperwork Requirements and Associated Tasks	Coal Mines		M/NM Mines		Total
		Small	Large	Small	Large	
62.110 to 62.130	Evaluate noise exposure; notify miners, prepare, post, and distribute administrative controls; and permit observation of monitoring.	(8,532)	(48,006)	6,595	3,567	(46,376)
62.171	Compile an audiometric test record; and obtain evidence.	153	692	582	873	2,301
62.172	Provide information and audiometric test record; and perform audiometric retests.	212	656	821	827	2,516
62.173	Perform otological evaluations; and provide information and notice.	1	4	4	5	15
62.174	Prepare a retraining certification; and review effectiveness of engineering and administrative controls.	16	53	62	67	198
62.175	Inform miners of test results and STS.	156	694	593	874	2,316
Total		(7,994)	(45,907)	8,658	6,213	(39,029)

The information collection requirements contained in this final rule have been submitted to the Office of Management and Budget (OMB) for review under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520), as implemented by OMB in regulations at 5 CFR part 1320. The Paperwork Reduction Act (44 U.S.C. 3502(3)(A)) defines collection of information as "the obtaining, causing to be obtained, soliciting, or requiring the disclosure to third parties or the public of facts or opinions by or for an agency regardless of form or format." Under the Paperwork Reduction Act, no person may be required to respond to, or may be subjected to a penalty for failure to comply with, these information collection requirements until they have been approved and MSHA has announced the assigned OMB control number. The OMB

control number, when assigned, will be announced by separate notice in the Federal Register. In accordance with § 1320.11(h) of the implementing regulations, OMB has 60 days from today's publication date in which to approve, disapprove, or instruct MSHA to make a change to the information collection requirements in this final rule.

The next sections show how the total burden hours were derived. Although the paperwork compliance costs are part of the final rule's total compliance costs estimated in Chapter IV of this REA, the paperwork compliance costs are presented again here in order to show their relationship to burden hours.

Existing §71.804(b) Supplemental Noise Exposure Survey; Reports and Certification

Existing §71.804(b) Supplemental Noise Exposure Survey; Reports and Certification requires coal mine operators to perform noise monitoring survey. In addition when miners are exposed to levels above 90 dBA, coal mine operators must file the supplemental survey. Under the final rule, coal mine operators are no longer required to perform the above tasks. The annual burden hour savings and cost savings are shown below.

Annual Burden Hour Savings and Annual Burden Cost Savings

Small Coal Mines(<20)

For Performing Surveys:

A survey report has to be prepared for 3,386 miners. It takes 30 minutes (0.5 hrs.) to perform the noise survey a by supervisor earning $43 per hour. These surveys are prepared twice a year.

Burden Hours Savings
3,386 miners X 0.5 hrs. X 2 = 3,386 hrs.

Burden Cost Savings
3,386 hrs. X $43 = $145,598

For Filing Surveys:

Each mine operator with miners exposed to noise levels above 90 dBA must file a noise survey. For each of the 567 mines, it takes a supervisor 6 minutes (0.1 hrs.) to instruct a clerical worker. It will take 3 minutes (0.05 hrs.) per miner for a clerical worker to file the survey. The hourly wage rate for a supervisor is $43 and the hourly wage rate for a clerical worker is $17. The survey report has to be prepared for 3,386 miners twice a year.

Burden Hours Savings
567 mines X 0.1 hrs. X 2 = 113.4 hrs.
3,386 miners X 0.05 X 2 = 338.6 hrs.

Burden Cost Savings
113.4 hrs. X $43 = $4,876
338.6 hrs. X $17 = $5,756

Large Coal Mines (>20)

For Performing Surveys:

A survey report has to be prepared for 21,193 miners. It takes 30 minutes (0.5 hrs.) to perform the noise survey by a supervisor earning $43 per hour. These surveys are prepared twice a year.

Burden Hours Savings
21,193 miners X 0.5 hrs. X 2 = 21,193 hrs.
Burden Cost Savings
21,193 hrs. X $43 = $911,299

For Filing Surveys:

Each mine operator with miners exposed to noise levels above 90 dBA must file a noise survey. For each of the 292 mines, it takes a supervisor 6 minutes (0.1 hrs.) to instruct a clerical worker. In addition to the 6 minutes for receiving instructions, it will take another 3 minutes (.05 hrs.) per miner for a clerical worker to file the survey. The hourly wage rate for a supervisor is $43 and the hourly wage rate for a clerical worker is $17. Surveys have to be filed for 21,193 miners twice a year.

Burden Hours Savings
292 mines X 0.1 hrs. X 2 = 58.4 hrs.
21,193 miners X 0.05 hrs. X 2 = 2,119.3 hrs.
Burden Cost Savings
58.4 hrs. X $43 = $2,511
2,119.3 hrs. X $17 = $36,028

Existing §71.805(b)(2) Violation of Noise Standard; Notice of Violation; Action Required by Operator

Under the existing rule, the coal mine operator is required to develop a written hearing conservation program (HCP) if a noise citation is issued. Since the final rule no longer requires it, there will be a reduction in burden hours and a cost burden savings.

Annual Burden Hours Savings and Annual Burden Cost Savings
Small Coal Mines(<20)

MSHA estimates that it takes a coal mine supervisor 4 hours to write the HCP and a clerical worker 2 hours to type and edit the written HCP. A written HCP is required for each noise citation. The average number of citations per year for small coal mines is 89. The hourly wage rate for a supervisor is $43 and the hourly wage rate for a clerical worker is $17.

Burden Hours Savings
89 X 4 hrs. = 356 hrs.
89 X 2 hrs. = 178 hrs.
Burden Cost Savings
356 hrs. X $43 = $15,308
178 hrs. X $17 = $3,026

Large Coal Mines (>20)

MSHA estimates that it takes a coal mine supervisor 4 hours to write the HCP and a clerical worker 2 hours to type and edit the written HCP. A written HCP is required for each noise citation. The average number of citations per year for small coal mines is 67. The hourly wage rate for a supervisor is $43 and the hourly wage rate for a clerical worker is $17.

Burden Hours Savings
67 X 4 hrs. = 268 hrs.
67 X 2 hrs. = 134 hrs.
Burden Cost Savings
268 hrs. X $43 = $11,524
134 hrs. X $17 = $2,278

Existing §71.804(c) Supplemental Noise Exposure Survey; Reports and Certification

Under the existing rule, all coal mine operators are required semiannually to produce a survey report and to prepare a survey certification. The final rule eliminates these requirements and results in reduced burden hours and burden cost.

Annual Burden Hours Savings and Annual Burden Cost Savings
Small Coal Mines (<20)

Survey Report:
MSHA estimates that it takes 3 minutes (0.05 hrs.) for a coal mine supervisor to prepare each survey report twice a year. The existing rule requires all 2,401 coal mines to comply with this provision. The hourly wage rate for a coal mine supervisor is $43.

Burden Hours Savings
2,401 mines X 0.05 hrs. X 2 = 240.1 hrs.
Burden Cost Savings
240.1 hrs. X $43 = $10,324

Certification:
MSHA estimates that it takes 3 minutes (0.05 hrs.) for a coal mine supervisor to prepare each survey certification twice a year. The existing rule requires all 2,401 coal mines to comply with this provision. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
2,401 mines X 0.05 hrs. X 2 = 240.1 hrs.
Burden Cost Savings
240.1 hrs. X $43 = $10,324

Large Coal Mines (≥20)
Survey Report:
MSHA estimates that it takes 3 minutes (0.05 hrs.) for a coal mine supervisor to prepare each survey report twice a year. The existing rule requires all 1,133 coal mines to comply with this provision. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
1,133 X 0.05 hrs. X 2 = 113.3 hrs.
Burden Cost Savings
113.3 hrs. X $43 = $4,872

Certification:
MSHA estimates that it takes 3 minutes (0.05 hrs.) for a coal mine supervisor to prepare each survey certification twice a

year. The existing rule requires all 1,133 coal mines to comply with this provision. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
1,133 X 0.05 hrs. X 2 = 113.3 hrs.
Burden Cost Savings
113.3 hrs. X $43 = $4,872

Existing §70.506(d)(1) Noise Exposure Measurement Procedures: Instrument Setting; Calibration

The existing rule requires all coal mine operators to prepare an annual calibration report. The final rule eliminates this requirement and results in reduced burden hours and burden cost.

Annual Burden Hours Savings and Annual Burden Cost Savings
Small Coal Mines(<20)

MSHA estimates that it takes 15 minutes (0.25 hrs.) for a coal mine supervisor to prepare each calibration report. The existing rule requires all 2,401 coal mines to comply with this provision. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
2,401 X 0.25 hrs. = 600.25 hrs.
Burden Cost Savings
600.25 hrs. X $43 = $25,811

Large Coal Mines (≥20)

MSHA estimates that it takes 15 minutes (0.25 hrs.) for a coal mine supervisor to prepare each calibration report. The existing rule requires all 1,133 coal mines to comply with this provision. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
1,133 X 0.25 hrs. = 283.25 hrs.
Burden Cost Savings
283.25 hrs. X $43 = $12,180

Existing §71.802(b) Initial Noise Exposure Survey

Under the existing rule, coal mine operators must record semiannually the noise exposure of all their miners. The final rule replaces this provision with §62.110(d) and results in reduced burden hours and burden cost.

Annual Burden Hours Savings and Annual Burden Cost Savings
Small Coal Mines(<20)

MSHA estimates that it takes 6 minutes (0.1 hrs.) of supervisor's time to record each miner's noise monitoring. This is done twice a year. The existing rule requires supervisors in small coal mines to record all 14,347 coal miners' noise exposure levels. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
14,347 X 0.1 hrs. X 2 = 2,869.4 hrs.
Burden Cost Savings
2,869.4 hrs. X $43 = $123,384

Large Coal Mines (≥20)

MSHA estimates that it takes 6 minutes (0.1 hrs.) of supervisor's time to record each miner's noise monitoring. This is done twice a year. The existing rule requires supervisors in large coal mines to record all 82,142 coal miners' noise exposure levels. The hourly wage rate for a supervisor is $43.

Burden Hours Savings
82,142 X 0.1hrs. X 2 = 16,428.4 hrs.
Burden Cost Savings
16,428.4 hrs. X $43 = $706,421

§ 62.110(a) Dose Determination

The provision requires operators to establish a system of monitoring, which effectively evaluates each miner's exposure sufficiently to determine if such exposure exceeds the action level, permissible exposure level, dual hearing protection level, or ceiling level. The burden below pertains to the time required to perform dose determination.

Year One Burden Hours and Burden Costs
Small Coal Mines (<20)

All 1,076 small coal mines will perform dose determination in the first year. It will require two hours of a supervisor's time, per mine, to perform dose determination.

Burden Hours
1,076 mines X 2 hrs. = 2,152 hrs.
Burden Costs
2,152 hrs. X $43 per hour = $92,536

The final rule will also provide savings for small coal mines. The savings per miner are equal to 30 minutes (0.5 hours) of a supervisor's time, twice a year. There are 3,386 affected miners under the final rule.

Burden Hours Savings
3,386 miners X 0.5 hrs. X 2 = 3,386 hrs.
Burden Savings
3,386 hrs. X $43 per hour = $145,598

Net Burden Hours Savings
3,386 hrs. - 2,152 hrs. = 1,234 hrs.
Net Burden Savings
$145,598 - $92,536 = $53,062

Large Coal Mines (≥20)

All 826 large coal mines will perform dose determination in the first year. It will require five hours of a supervisor's time to perform dose determination.

Burden Hours
826 mines X 5 hrs. = 4,130 hrs.
Burden Costs
4,130 hrs. X $43 per hour = $177,590

The final rule will also provide savings for large coal mines. The savings per miner are equal to 30 minutes (.5 hours)

of a supervisor's time, twice a year. There are 21,193 affected miners under the final rule.

Burden Hours Savings
21,193 miners X 0.5 hrs. X 2 = 21,193 hrs.
Burden Savings
21,193 hrs. X $43 per hour = $911,299

Net Burden Hours Savings
21,193 hrs. - 4,130 hrs. = 17,063 hrs.
Net Burden Savings
$911,299 - $177,590 = $733,709

Small Metal/Nonmetal Mines (<20)

All 4,570 small metal/nonmetal mines will perform dose determination in the first year. It will take two hours of a supervisor's time to perform dose determination.

Burden Hours
4,570 mines X 2 hrs. = 9,140 hrs.
Burden Costs
9,140 hrs. X $36 per hour = $329,040

Large Metal/Nonmetal Mines (≥20)

All 782 large metal/nonmetal mines will perform dose determination in the first year. It will take five hours of a supervisor's time to perform dose determination.

Burden Hours
782 mines X 5 hrs. = 3,910 hrs.
Burden Costs
3,910 hrs. X $36 per hour = $140,760

Annual Burden Hours and Annual Burden Costs
Small Coal Mines (<20)

MSHA estimates 538 small coal mines will perform dose determination in each subsequent year. It will require two hours of a supervisor's time, per mine, to perform dose determination.

Burden Hours
538 mines X 2 hrs. = 1,076 hrs.
Burden Costs
1,076 hrs. X $43 per hour = $46,268

The final rule will also provide savings for small coal mines. The savings per miner are equal to 30 minutes (0.5 hours)

of a supervisor's time, twice a year. There are 1,693 affected miners under the final rule.

Burden Hours Savings
1,693 miners X 0.5 hrs. X 2 = 1,693 hrs.
Burden Savings
1,693 hrs. X $43 per hour = $72,799

Net Burden Hours Savings
1,693 hrs. - 1,076 hrs. = 617 hrs.
Net Burden Savings
$72,799 - $46,268 = $26,531

Large Coal Mines (≥20)

MSHA estimates 413 large coal mines will perform dose determination in each subsequent year. It will require five hours of a miner's and a supervisor's time to perform dose determination.

Burden Hours
413 mines X 5 hrs. = 2,065 hrs.
Burden Costs
2,065 hrs. X $43 per hour = $88,795

The final rule will also provide savings for large coal mines. The savings per miner are equal to 30 minutes (0.5 hours) of a miner's and a supervisor's time twice a year. There are 10,597 affected miners under the final rule.

Burden Hours Savings
10,597 miners X 0.5 hrs. X 2 = 10,597 hrs.
Burden Savings
10,597 hrs. X $43 per hour = $455,671

Net Burden Hours Savings
10,597 hrs. - 2,065 hrs. = 8,532 hrs.
Net Burden Savings
$455,671 - $88,795 = $366,876

Small Metal/Nonmetal Mines (<20)

MSHA estimates 2,285 small metal/nonmetal mines will perform dose determination in each subsequent year. It will take two hours of a supervisor's time to perform dose determination.

Burden Hours
2,285 miners X 2 hrs. = 4,570 hrs.
Burden Costs

4,570 hrs. X $36 per hour = $164,520

Large Metal/Nonmetal Mines (≥20)

MSHA estimates 391 large metal/nonmetal mines will perform dose determination in each subsequent year. It will take five hours of a supervisor's time to perform dose determination.

Burden Hours
391 miners X 5 hrs. = 1,955 hrs.
Burden Costs
1,955 hrs. X $36 per hour = $70,380

§62.110(c) Notification of Observation of Noise Monitoring

Section 62.130 (c) requires mine operators to provide affected miners and their representatives an opportunity to observe noise exposure monitoring. Mine operators do not pay miners or their representatives for the time spent to observe noise monitoring. In addition, mine operators must give prior notice of the date and time of intended noise exposure monitoring to affected miners and their representatives. They can choose to give oral notification, distribute a written notice to each miner to be monitored, or post a notice. MSHA estimates that about 45% of mine operators (769 small coal mines, 401 large coal mines, 3,049 small metal/nonmetal mines, 494 large metal/nonmetal mines) will inform miners and their representatives orally; 35% of mine operators (598 small coal mines, 312 large coal mines, 2,371 small metal/nonmetal mines, 384 large metal/nonmetal mines) will post a written notice; and 20% of mine operators (342 small coal mines, 178 large coal mines, 1,355 small metal/nonmetal mines, 220 large metal/nonmetal mines) will distribute a written notice to each affected miner.

Annual Burden Hours and Annual Burden Costs
Small Coal Mines (<20)

Oral Notification:

For each of the 769 mines, it will take 2 minutes (0.033 hrs.) of supervisor's time for oral notification. A coal mine supervisor's hourly wage rate is $43.

Burden Hours
769 mines X 0.033 hrs. = 25.38 hrs.
Burden Costs
25.38 hrs. X $43 per hour = $1,091

Posted Notification:

For each of the 598 mines, it will take 6 minutes (0.1 hrs.) for a mine supervisor to instruct a clerical worker. The clerical worker will need 4.8 minutes (0.08 hrs.) to prepare and post a notice. On average, a small mine will post 3 notices in the mine. A coal mine supervisor's hourly wage is $43 and the clerical worker's hourly wage is $17.

Burden Hours
598 mines X 0.1 hrs. = 59.8 hrs.
598 mines X 0.08 hrs. X 3 notices = 143.52 hrs.
Burden Costs
59.8 hrs. X $43 = $2,571
143.52 hrs. X $17 = $2,440
Written Notification:

For each of the 342 mines, it will take 6 minutes (0.1 hrs.) for a supervisor to give instructions to a clerical worker. It will take a clerical worker 4.8 minutes (0.08 hrs.) to prepare and distribute a written notice to each of the 2,043 affected miners. A coal mine supervisor's hourly wage is $43 and the clerical worker's hourly wage is $17.

Burden Hours
342 mines X 0.1 hrs. = 34.2 hrs.
2,043 miners X 0.08hrs. = 163.44 hrs.
Burden Costs
34.2 hrs. X $43 = $1,471
163.44 hrs. X $17 = $2,778

Large Coal Mines (≥20)

Oral Notification:

For each of the 401 mines, it will take 2 minutes (0.033 hrs.) of supervisor's time for oral notification. A coal mine supervisor's hourly wage rate is $43.

Burden Hours
401 mines X 0.033 hrs. = 13.23 hrs.
Burden Costs
13.23 hrs. X $43 per hour = $569

Posted Notification:

For each of the 312 mines, it will take 6 minutes(0.1 hrs.) for a mine supervisor to instruct a clerical worker. The clerical worker will need another 4.8 minutes (0.08 hrs.) to prepare and post a notice. On average, a large mine will post 6 notices in the mine. A coal mine supervisor's hourly wage is $43 and the clerical worker's hourly wage is $17.

Burden Hours
312 mines X 0.1 hrs. = 31.2 hrs.
312 mines X 0.08 hrs. X 6 notices = 149.76 hrs.
Burden Costs
31.2 hrs. X $43 = $1,342
149.76 hrs. X $17 = $2,546

Written Notification:

For each of the 178 mines, it will take 6 minutes (0.1 hrs.) for a supervisor to give instructions to a clerical worker. It will take a clerical worker 4.8 minutes (0.08 hrs.) to prepare and distribute a written notice to each of the 12,929 affected miners. A coal mine supervisor's hourly wage is $43 and the clerical worker's hourly wage is $17.

Burden Hours
178 mines X 0.1 hrs. = 17.8 hrs.
12,929 miners X 0.08hrs. = 1034.32 hrs.
Burden Costs
17.8 hrs. X $43 = $765
1034.32 hrs. X $17 = $17,583

Small Metal/Nonmetal Mines (<20)

Oral Notification:

For each of the 3,049 mines, it will take 2 minutes (0.033 hrs.) of supervisor's time for oral notification. A metal/nonmetal mine supervisor's hourly wage rate is $36.

Burden Hours
3,049 mines X 0.033 hrs. = 100.62 hrs.
Burden Costs
100.62 hrs. X $36 = $3,622

Posted Notification:

For each of the 2,371 mines, it will take 6 minutes (0.1 hrs.) for a mine supervisor to instruct a clerical worker. The clerical worker will need 4.8 minutes (0.08 hrs.) to prepare and post a notice. On average, a small mine will post 3 notices in the mine. A metal/nonmetal mine supervisor's hourly wage is $36 and the clerical worker's hourly wage is $17.

Burden Hours
2,371 mines X 0.1 hrs. = 237.1 hrs.
2,371 mines X 0.08 hrs. X 3 = 569.04 hrs.
Burden Costs
237.1 hrs. X $36 = $8,536
569.04 hrs. X $17 = $9,674

Written Notification:

For each of the 1,355 mines, it will take 6 minutes (0.1 hrs.) for a supervisor to give instructions to a clerical worker. It will take a clerical worker 4.8 minutes (0.08 hrs.) to prepare and distribute a written notice to each of the 7,631 affected miners. A metal/nonmetal mine supervisor's hourly wage is $36 and the clerical worker's hourly wage is $17.

Burden Hours
1,355 mines X 0.1 hrs. = 135.5 hrs.
7,631 miners X 0.08 hrs. = 610.48 hrs.
Burden Costs
135.5 hrs. X $36 = $4,878
610.48 hrs. X $17 = $10,378

Large Metal/Nonmetal Mines (≥20)

Oral Notification:

For each of the 494 mines, it will take 2 minutes (0.033 hrs.) of supervisor's time for oral notification. A metal/nonmetal mine supervisor's hourly wage rate is $36.

Burden Hours
494 mines X 0.033 hrs. = 16.30 hrs.
Burden Costs
16.30 hrs. X $36 = $587

Posted Notification:

For each of the 384 mines, it will take 6 minutes (0.1 hrs.) for a mine supervisor to instruct a clerical worker. The clerical worker will need 4.8 minutes (0.08 hrs.) to prepare and post a notice. On average, a large mine will post 6 notices in the mine. A metal/nonmetal mine supervisor's hourly wage is $36 and the clerical worker's hourly wage is $17.

Burden Hours
384 mines X 0.1 hrs. = 38.4 hrs.
384 mines X 0.08 hrs. X 6 = 184.32 hrs.
Burden Costs
38.4 hrs. X $36 = $1,382
184.32 hrs. X $17 = $3,133

Written Notification:

For each of the 220 mines, it will take 6 minutes (0.1 hrs.) for a supervisor to give instructions to a clerical worker. It will take a clerical worker 4.8 minutes (0.08 hrs.) to prepare and distribute a written notice to each of the 16,129 affected miners. A metal/nonmetal mine supervisor's hourly wage is $36 and the clerical worker's hourly wage is $17.

Burden Hours
220 mines X 0.1 hrs. = 22 hrs.
16,129 miners X 0.08 hrs. = 1,290.32 hrs.
Burden Costs
22 hrs. X $36 = $792
1,290.32 hrs. X $17 = $21,935

§62.110(d) Miner Notification

Section 62.110(d) requires the mine operator to notify, in writing, miners whose noise exposures equal or exceed the action level, exceed the permissible exposure level, or exceed the dual hearing protection level.

First Year Burden Hours and Burden Costs
Small Coal Mines (<20)

For each of the 1,710 mines in which miners are exposed to noise levels at or above the action level, a mine supervisor spends 6 minutes (0.1 hrs.) to give instructions to a clerical worker. The clerical worker spends 4.8 minutes (0.08 hrs.) to prepare and distribute the notification for each of the 10,215 affected miners. A coal mine supervisor's hourly wage rate is $43 and a clerical worker's hourly wage rate is $17.

Burden Hours
1,710 mines X 0.1 hrs. = 171 hrs.
10,215 miners X 0.08 hrs. = 817.2 hrs.
Burden Costs
171 hrs X $43 = $7,353
817.2 hrs. X $17 = $13,892

Large Coal Mines (≥20)

For each of the 892 mines in which miners are exposed to noise levels at or above the action level, a mine supervisor spends 6 minutes (0.1 hrs.) to give instructions to a clerical worker. The clerical worker spends 4.8 minutes (0.08 hrs.) to prepare and distribute the notification for each of the 64,646 affected miners. A coal mine supervisor's hourly wage rate is $43 and a clerical worker's hourly wage rate is $17.

Burden Hours
892 mines X 0.1 hrs. = 89.2 hrs.
64,646 miners X 0.08 hrs. = 5,171.68 hrs.
Burden Costs
89.2 hrs X $43 = $3,836
5,171.68 hrs. X $17 = $87,919

Small Metal/Nonmetal Mines (<20)

For each of the 6,776 mines in which miners are exposed to noise levels at or above the action level, a mine supervisor spends 6 minutes (0.1 hrs.) to give instructions to a clerical worker. The clerical worker spends 4.8 minutes (0.08 hrs.) to prepare and distribute the notification for each of the 38,153

affected miners. A metal/nonmetal mine supervisor's hourly wage rate is $36 and a clerical worker's hourly wage rate is $17.

Burden Hours
6,776 mines X 0.1 hrs. = 677.6 hrs.
38,153 miners X 0.08 hrs. = 3,052.24 hrs.
Burden Costs
677.6 hrs. X $36 = $24,394
3,052.24 hrs. X $17 = $51,888

Large Metal/Nonmetal Mines (≥20)

For each of the 1,098 mines in which miners are exposed to noise levels at or above the action level, a mine supervisor spends 6 minutes (0.1 hrs.) to give instructions to a clerical worker. The clerical worker spends 4.8 minutes (0.08 hrs.) to prepare and distribute the notification for each of the 80,647 affected miners. A metal/nonmetal mine supervisor's hourly wage rate is $36 and a clerical worker's hourly wage rate is $17.

Burden Hours
1,098 mines X 0.1 hrs. = 109.8 hrs.
80,647 miners X 0.08 hrs. = 6,451.76 hrs.
Annualized Burden Cost
109.8 hrs. X $36 = $3,953
6,451.76 hrs. X $17 = $109,680

§62.130 (a) Permissible Exposure Level

When administrative controls are used to reduce a miner's exposure, the final rule requires the mine operator to write and post the procedures for such controls on the mine bulletin board and to provide a copy to the affected miners.

First Year Burden Hours and Burden Costs
Small Coal Mines(<20)

MSHA estimates that it will take 45 minutes (0.75 hrs.) of a supervisor's time to write administrative controls (including a negligible amount of time to give instructions to a clerical) and an additional 45 minutes (0.75 hrs.) of a clerical worker's time to type, edit, and post the controls. Distributing copies will take 3 minutes (0.05 hrs.) of the clerical worker's time for each of the 508 affected miners. The final rule requires supervisors to write administrative controls for 85 small coal mines with miners exposed to noise levels above TWA_8 of 90 dBA and able to use administrative controls. The hourly wage rate for a coal mine supervisor is $43 and the hourly wage rate for a clerical worker is $17.

Burden Hours
85 mines X 0.75 hrs. = 63.75 hrs.
(85 mines X 0.75 hrs.) + (508 miners X 0.05 hrs.) = 89.15 hrs.
Burden Costs
63.75 hrs. X $43 = $2,741
89.15 hrs. X $17 = $1,516

Large Coal Mines ($\geq$20)

MSHA estimates that it will take 90 minutes (1.5 hrs.) of a supervisor's time to write administrative controls (including a negligible amount of time to give instructions to a clerical) and an additional 45 minutes (0.75 hrs.) of a clerical worker's time to type, edit, and post the controls. Distributing copies will take 3 minutes (0.05 hrs.) of the clerical worker's time for each of the 7,417 affected miners. The final rule requires supervisors to write administrative controls for 102 large coal mines with miners exposed to noise levels above a TWA_8 of 90 dBA and able to use administrative controls. The hourly wage rate for a supervisor is $43 and the hourly wage rate for a clerical worker is $17.

Burden Hours
102 mines X 1.5 hrs. = 153 hrs.
(102 mines X 0.75 hrs.) + (7,417 X 0.05 hrs.) = 447.35 hrs.
Burden Costs

153 hrs. X $43 = $6,579
447.35 hrs. X $17 = $7,605

Small Metal/Nonmetal Mines

MSHA estimates that it will take 45 minutes (0.75 hrs.) of a supervisor's time to write administrative controls (including a negligible amount of time to give instructions to a clerical) and an additional 45 minutes (0.75 hrs.) of a clerical worker's time to type, edit, and post the controls. Distributing copies will take 3 minutes (0.05 hrs.) of the clerical worker's time for each of the 262 affected miners. The final rule requires supervisors to write administrative controls for 46 small metal/nonmetal mines with miners exposed to noise levels above a TWA_8 of 90 dBA and able to use administrative controls. The hourly wage rate for a supervisor is $36 and the hourly wage rate for a clerical worker is $17.

Burden Hours
46 mines X 0.75 hrs. = 34.5 hrs.
(46 mines X 0.75 hrs.) + (262 miners X 0.05 hrs.) = 47.6 hrs.
Burden Costs
34.5 hrs. X $36 = $1,242
47.6 hrs. X $17 = $809

Large Metal/Nonmetal Mines

MSHA estimates that it will take 90 minutes (1.5 hrs.) of supervisor's time to write administrative controls (including a negligible amount of time to give instructions to a clerical) and an additional 45 minutes (0.75 hrs.) of clerical worker's time to type, edit, and post the controls. Distributing copies will take 3 minutes (0.05 hrs.) of clerical worker's time for each of the 6,896 affected miners. The final rule requires supervisors to write administrative controls for 94 large metal/nonmetal mines with miners exposed to noise levels above a TWA_8 of 90 dBA and able to use administrative controls. The hourly wage rate for a supervisor is $36 and the hourly wage rate for a clerical worker is $17.

Burden Hours
94 mines X 1.5 hrs. = 141 hrs.
(94 mines X 0.75 hrs.) + (6,896 miners X 0.05 hrs.) = 415.3 hrs.
Burden Costs
141 hrs. X $36 = $5,076
415.3 hrs. X $17 = $7,060

§62.170 (b) Audiometric Testing

The final rule requires that mine operators notify the miners who are exposed to noise levels at or above a TWA_8 of 85 dBA that audiometric testing is being offered. The paperwork burden and cost of §62.170 (a), concerning a baseline audiogram, are captured in the paperwork burden and cost for §62.170 (b).

Annual Burden Hours and Annual Burden Costs

Small Coal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about the audiometric testing notification. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to prepare and distribute a written notification. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 9,613 miners in 1,710 small coal mines affected by the provision.

Burden Hours
1,710 mines X 0.1 hrs = 171 hrs.
9,613 miners X 0.08 hrs. = 769.04 hrs.
Burden Costs
171 hrs. X $43 = $7,353
769.04 hrs. X $17 = $13,074

Large Coal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about the audiometric testing notification. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to prepare and distribute a written notification. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 51,145 miners in 892 large coal mines affected by the provision.

Burden Hours
892 mines X 0.1 hrs = 89.2 hrs.
51,145 miners X 0.08 hrs. = 4,091.6 hrs.
Burden Costs
89.2 hrs. X $43 = $3,836
4,091.6 hrs. X $17 = $69,557

Small Metal/Nonmetal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about the audiometric testing notification. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to prepare and distribute a written notification. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 36,245 miners in 6,776 small metal/nonmetal mines affected by the provision.

Burden Hours
6,776 mines X 0.1 hrs = 677.6 hrs.
36,245 miners X 0.08 hrs. = 2,899.6 hrs.
Burden Costs
677.6 hrs. X $36 = $24,394
2,899.6 hrs. X $17 = $49,293

Large Metal/Nonmetal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about the audiometric testing notification. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to prepare and distribute a written notification. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 64,518 miners in 1,098 large metal/nonmetal mines affected by the provision.

Burden Hours
1,098 mines X 0.1 hrs = 109.8 hrs.
64,518 miners X 0.08 hrs. = 5,161.44 hrs.
Burden Cost
109.8 hrs. X $36 = $3,953
5,161.44 hrs. X $17 = $87,744

§62.171 Audiometric Test Procedures

The final rule requires mine operators to compile a test record for each miner tested. In Year 1, the affected miners include those miners who will take an audiometric test, an audiometric retest, and clinical-audiological or otological test. After the first year, there will be some miners who will take additional tests due to invalid first year test results. For every year thereafter, the number of miners who will be affected are presented in after-Year-1 calculations shown below.

First Year Burden Hours and Costs
Small Coal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to maintain the miner's audiometric record. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 10,625 miners in 1,710 small coal mines affected by the provision.

Burden Hours
1,710 mines X 0.1 hrs = 171 hrs.
10,625 miners X 0.08 hrs. = 850 hrs.
Burden Costs
171 hrs. X $43 = $7,353
850 hrs. X $17 = $14,450

Large Coal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 56,579 miners in 892 large coal mines affected by the provision.

Burden Hours
892 mines X 0.1 hrs = 89.2 hrs.
56,579 miners X 0.08 hrs. = 4,526.32 hrs.
Burden Costs
89.2 hrs. X $43 = $3,836
4,526.32 hrs. X $17 = $76,947

Small Metal/Nonmetal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 40,060 miners in 6,776 small metal/nonmetal mines affected by the provision.

Burden Hours
6,776 mines X 0.1 hrs = 677.6 hrs.
40,060 miners X 0.08 hrs. = 3,204.8 hrs.
Burden Costs
677.6 hrs. X $36 = $24,394
3,204.8 hrs. X $17 = $54,482

Large Metal/Nonmetal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about the maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 71,373 miners in 1,098 large metal/nonmetal mines affected by the provision.

Burden Hours
1,098 mines X 0.1 hrs = 109.8 hrs.
71,373 miners X 0.08 hrs. = 5,709.84hrs.
Burden Costs
109.8 hrs. X $36 = $3,953
5,709.84 hrs. X $17 = $97,067

Annual Burden Hours and Annual Burden Costs After First Year
Small Coal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.) per miner for a clerical worker to maintain the miner's audiometric record. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 1,594 miners in 257 small coal mines affected by the provision.

Burden Hours
257 mines X 0.1 hrs = 25.7 hrs.
1,594 miners X 0.08 hrs. = 127.52 hrs.

Burden Costs
25.7 hrs. X $43 = $1,105
127.52 hrs. X $17 = $2,168

Large Coal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.) per miner for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17. There are 8,487 miners in 134 large coal mines affected by the provision.

Burden Hours
134 mines X 0.1 hrs = 13.4 hrs.
8,487 miners X 0.08 hrs. = 678.96 hrs.
Burden Costs
13.4 hrs. X $43 = $576
678.96 hrs. X $17 = $11,542

Small Metal/Nonmetal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of 4.8 minutes (0.08 hrs.) per miner for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 6,009 miners in 1,016 small metal/nonmetal mines affected by the provision.

Burden Hours
1,016 mines X 0.1 hrs = 101.6 hrs.
6,009 miners X 0.08 hrs. = 480.72 hrs.
Burden Costs
101.6 hrs. X $36 = $3,658
480.72 hrs. X $17 = $8,172

Large Metal/Nonmetal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about maintaining audiometric test records. It will take an average of

4.8 minutes (0.08 hrs.) per miner for a clerical worker to maintain audiometric test records. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17. There are 10,706 miners in 165 large metal/nonmetal mines affected by the provision.

Burden Hours
165 mines X 0.1 hrs = 16.5 hrs.
10,706 miners X 0.08 hrs. = 856.48 hrs.
Burden Costs
16.5 hrs. X $36 = $594
856.48 hrs. X $17 = $14,560

§62.172 (a)(1) Provide Copy of Record

The final rule requires the miner to take an audiometric retest if the baseline audiogram is found invalid in Year 1. The operator must give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record.

Providing Audiogram Test Records to Physicians, Audiologists, and Qualified Technicians

First Year Burden Hours and Costs

Small Coal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 9,613 miners in 1,609 small coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
1,609 mines X 0.1 hrs. = 160.9 hrs.
9,613 miners X 0.08 hrs. = 769.04 hrs.

Burden Costs
160.9 hrs. X $43 = $6,919
769.04 hrs. X $17 = $13,074

Large Coal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 51,145 miners in 706 large coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
706 mines X 0.1 hrs. = 70.6 hrs.
51,145 miners X 0.08 hrs. = 4,091.6 hrs.

Burden Costs

70.6 hrs. X $43 = $3,036
4,091.6 hrs. X $17 = $69,557

Small Metal/Nonmetal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 36,245 miners in 6,437 small metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
6,437 mines X 0.1 hrs. = 643.7 hrs.
36,245 miners X 0.08 hrs. = 2,899.6 hrs.

Burden Costs
643.7 hrs. X $36 = $23,173
2,899.6 hrs. X $17 = $49,293

Large Metal/Nonmetal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 64,518 miners in 878 large metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
878 mines X 0.1 hrs. = 87.8 hrs.
64,518 miners X 0.08 hrs. = 5,161.44 hrs.

Burden Costs
87.8 hrs. X $36 = $3,161
5,161.44 hrs. X $17 = $87,744

Providing Audiogram Test Records to Physicians, Audiologists, and Qualified Technicians

Annual Burden Hours and Annual Burden Costs After First Year

Small Coal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 1,442 miners in 241 small coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
241 mines X 0.1 hrs. = 24.1 hrs.
1,442 miners X 0.08 hrs. = 115.36 hrs.

Burden Costs
24.1 hrs. X $43 = $1,036
115.36 hrs. X $17 = $1,961

Large Coal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 7,672 miners in 106 large coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
106 mines X 0.1 hrs. X = 10.6 hrs.
7,672 miners X 0.08 hrs. = 613.76 hrs.

Burden Costs
10.6 hrs. X $43 = $456
613.76 hrs. X $17 = $10,434

Small Metal/Nonmetal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 5,437 miners in 966 small metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours

966 mines X 0.1 hrs. = 96.6 hrs.
5,437 miners X 0.08 hrs. = 434.96 hrs.

Burden Costs
96.6 hrs. X $36 = $3,478
434.96 hrs. X $17 = $7,394

Large Metal/Nonmetal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding providing a skilled medical professional with a copy of the miner's audiometric test record. The clerical worker will take 4.8 minutes (0.08 hrs.) per miner to provide audiometric test records. There are 9,678 miners in 132 large metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
132 mines X 0.1 hrs. = 13.2 hrs.
9,678 miners X 0.08 hrs. = 774.24 hrs.

Burden Costs
13.2 hrs. X $36 = $475
774.24 hrs. X $17 = $13,162

§62.172 (a)(3) To Instruct Physician or Audiologist

The final rule requires the miner to take an audiometric retest if the baseline audiogram is found invalid in Year 1. The operator must give instructions to the clerical worker regarding informing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector.

Instructing the Physicians, Audiologists, and Qualified Technicians

First Year Burden Hours and Costs

Small Coal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 9,613 miners in 1,609 small coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
1,609 mines X 0.1 hrs. = 160.9 hrs.
1,609 mines X 0.2 hrs. = 321.8 hrs.

Burden Costs
160.9 hrs. X $43 = $6,919
321.8 hrs. X $17 = $5,471

Large Coal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 51,145 miners in 706 large coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
706 mines X 0.1 hrs. = 70.6 hrs.
706 mines X 0.2 hrs. = 141.2 hrs.

Burden Costs

70.6 hrs. X $43 = $3,036
141.2 hrs. X $17 = $2,400

Small Metal/Nonmetal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 36,245 miners in 6,437 small metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
6,437 mines X 0.1 hrs. = 643.7 hrs.
6,437 mines X 0.2 hrs. = 1,287.4 hrs.

Burden Costs
643.7 hrs. X $36 = $23,173
1,287.4 hrs. X $17 = $21,886

Large Metal/Nonmetal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 64,518 miners in 878 large metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
878 mines X 0.1 hrs. = 87.8 hrs.
878 mines X 0.2 hrs. = 175.6 hrs.

Burden Costs
87.8 hrs. X $36 = $3,161
175.6 hrs. X $17 = $2,985

Instructing the Physicians, Audiologists, and Qualified Technicians

Annual Burden Hours and Annual Burden Costs After First Year

Small Coal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 1,442 miners in 241 small coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
241 mines X 0.1 hrs. = 24.1 hrs.
241 mines X 0.2 hrs. = 48.2 hrs.

Burden Costs
24.1 hrs. X $43 = $1,036
48.2 hrs. X $17 = $819

Large Coal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 7,672 miners in 106 large coal mines. A coal mine supervisor makes $43 per hour and a clerical worker makes $17 an hour.

Burden Hours
106 mines X 0.1 hrs. = 10.6 hrs.
106 mines X 0.2 hrs. = 21.2 hrs.

Burden Costs
10.6 hrs. X $43 = $456
21.2 hrs. X $17 = $360

Small Metal/Nonmetal Mines (<20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. A coal mine supervisor makes $36 per hour and a clerical makes $17 an hour. There are 5,437 miners in 966 small metal/nonmetal mines. A coal mine

supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
966 mines X 0.1 hrs. = 96.6 hrs.
966 mines X 0.2 hrs. = 193.2 hrs.

Burden Costs
96.6 hrs. X $36 = $3,478
193.2 hrs. X $17 = $3,284

Large Metal/Nonmetal Mines (≥20)

The mine operator will take about 6 minutes (0.1 hrs.) each to give instructions to the clerical worker regarding instructing the physician, audiologist, or qualified technician not to reveal any findings unrelated to the miner's exposure to noise or to the miner's wearing of a hearing protector. The clerical worker will take 12 minutes (0.2 hrs.) per mine to instruct physicians, audiologists, and qualified technicians. There are 9,678 miners in 132 large metal/nonmetal mines. A coal mine supervisor makes $36 per hour and a clerical worker makes $17 an hour.

Burden Hours
132 mines X 0.1 hrs. = 13.2 hrs.
132 mines X 0.2 hrs. = 26.4 hrs.

Burden Costs
13.2 hrs. X $36 = $475
26.4 hrs. X $17 = $449

§62.173 Follow-up Evaluation When an Audiogram is Invalid

Under the final rule, if a valid audiogram cannot be obtained due to suspected medical pathology of the ear that the physician or audiologist believes was caused or aggravated by the miner's occupational exposure to noise or the wearing of hearing protectors, then the mine operator must notify those miners who need a clinical-audiological or otological test and their physicians/ audiologists. In Year 1, those miners affected will be 51 miners in 8 small coal mines, 320 miners in 4 large coal mines, 191 miners in 34 small metal/nonmetal mines, and 403 miners in 5 large metal/nonmetal mines. Each year after the first year, there will be 8 miners in 1 small coal mine, 48 miners in 1 large coal mine, 29 miners in 5 small metal/nonmetal mines, and 60 miners in 1 large metal/nonmetal mine who will have a follow-up evaluation.

First Year Burden Hours and Costs
Small Coal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
8 mines X 0.1 hrs. X 2 = 1.6 hrs.
(8 mines X 0.2 hrs.) + (51 miners X 0.08 hrs.) = 5.68 hrs.
Burden Costs
1.6 hrs. X $43 = $69
5.68 hrs. X $17 = $97

Large Coal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
4 mines X 0.1 hrs. X 2 = 0.8 hrs.
(4 mines X 0.2 hrs.) + (320 miners X 0.08 hrs.) = 26.4 hrs.
Burden Costs
0.8 hrs. X $43 = $34
26.4 hrs. X $17 = $449

Small Metal/Nonmetal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
34 mines X 0.1 hrs. X 2 = 6.8 hrs.
(34 mines X 0.2 hrs.) + (191 miners X 0.08 hrs.) = 22.08 hrs.
Burden Costs
6.8 hrs. X $36 = $245
22.08 hrs. X $17 = $375

Large Metal/Nonmetal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
5 mines X 0.1 hrs. X 2 = 1 hrs.
(5 mines X 0.2 hrs.) + (403 miners X 0.08 hrs.) = 33.24 hrs.
Burden Costs
1 hrs. X $36 = $36
33.24 hrs. X $17 = $565

Annual Burden Hours and Annual Burden Costs After First Year
Small Coal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. X 2 = 0.2 hrs.
(1 mine X 0.2 hrs.) + (8 miners X 0.08 hrs.) = 0.84 hrs.
Burden Costs
0.2 hrs. X $43 = $9
0.84 hrs. X $17 = $14

Large Coal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. X 2 = 0.2 hrs.
(1 mine X 0.2 hrs.) + (48 miners X 0.08 hrs.) = 4.04 hrs.
Burden Costs
0.2 hrs. X $43 = $9
4.04 hrs. X $17 = $69

Small Metal/Nonmetal Mines (<20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
5 mines X 0.1 hrs. X 2 = 1 hrs.
(5 mines X 0.2 hrs.) + (29 miners X 0.08 hrs.) = 3.32 hrs.
Burden Costs
1 hrs. X $36 = $36
3.32 hrs. X $17 = $56

Large Metal/Nonmetal Mines (≥20)

It will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying appropriate miners to have a clinical-audiological evaluation or an otological examination. Furthermore, it would take the same amount of time for the mine operator to inform a clerical worker to instruct the physician, or audiologist to inform the miner of the need for an otological examination if a valid audiogram cannot be obtained due to a medical pathology of the ear, and to tell the physician not to reveal any specific findings or diagnoses unrelated to the miner's occupational exposure to noise or the wearing of hearing protectors without the written consent of the miner. The clerical worker will take 4.8 minutes (0.08 hrs.) to notify each affected miner and 12 minutes (0.2 hrs.) to notify a physician/audiologist. The hourly wage for a mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. X 2 = 0.2 hrs.
(1 mine X 0.2 hrs.) + (60 miners X 0.08 hrs.) = 5.0 hrs.
Burden Costs
0.2 hrs. X $36 = $7
5.0 hrs. X $17 = $85

§62.174 Follow-up Corrective Measures When a Standard Threshold Shift is Detected

Retraining:

Under this provision of the final rule, the mine operator must retrain miners who show evidence of a standard threshold shift and keep a record of retraining.

First Year Burden Hours and Cost

Small Coal Mines (<20)

A supervisor can retrain all the miners in a small mine operation in one session. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A coal mine supervisor makes $43 an hour. About 161 small coal mines will be affected under this provision.

Burden Hours
161 mines X 0.35 hrs. X 1 session = 56.35 hrs.

Burden Cost
56.35 hrs. X $43 = $2,423

Large Coal Mines (≥20)

A supervisor can retrain all the miners in a large mine operation in three sessions. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A coal mine supervisor makes $43 an hour. About 71 large coal mines will be affected under this provision.

Burden Hours
71 mines X 0.35 hrs. X 3 sessions = 74.55 hrs.

Burden Cost
74.55 hrs. X $43 = $3,206

Small Metal/Nonmetal Mines (<20)

A supervisor can retrain all the miners in a small mine operation in one session. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A metal/nonmetal mine supervisor makes $36 an hour. About 645 small metal/nonmetal mines will be affected under this provision.

Burden Hours
645 mines X 0.35 hrs. X 1 session = 225.75 hrs.

Burden Cost

225.75 hrs. X $36 = $8,127

Large Metal/Nonmetal Mines (≥20)

A supervisor can retrain all the miners in a large mine operation in three sessions. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A metal/nonmetal mine supervisor makes $36 an hour. About 89 large metal/nonmetal mines will be affected under this provision.

Burden Hours
89 mines X 0.35 hrs. X 3 sessions = 93.45 hrs.

Burden Cost
93.45 hrs. X $36 = $3,364

Annual Burden Hours and Annual Burden Cost After First Year
Small Coal Mines (<20)

A supervisor can retrain all the miners in a small mine operation in one session. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A coal mine supervisor makes $43 an hour. About 25 small coal mines will be affected under this provision.

Burden Hours
25 mines X 0.35 hrs. X 1 session = 8.75 hrs.

Burden Cost
8.75 hrs. X $43 = $376

Large Coal Mines (≥20)

A supervisor can retrain all the miners in a large mine operation in three sessions. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A coal mine supervisor makes $43 an hour. About 11 large coal mines will be affected under this provision.

Burden Hours
11 mines X 0.35 hrs. X 3 sessions = 11.55 hrs.

Burden Cost
11.55 hrs. X $43 = $497

Small Metal/Nonmetal Mines (<20)

A supervisor can retrain all the miners in a small mine operation in one session. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A metal/nonmetal mine supervisor makes $36 an hour. About 98 small metal/nonmetal mines will be affected under this provision.

Burden Hours
98 mines X 0.35 hrs. X 1 session = 34.3 hrs.

Burden Cost
34.3 hrs. X $36 = $1,235

Large Metal/Nonmetal Mines (≥20)

A supervisor can retrain all the miners in a large mine operation in three sessions. MSHA estimates that it will take 21 minutes (0.35 hrs.) for a retraining session. A metal/nonmetal mine supervisor makes $36 an hour. About 14 large metal/nonmetal mines will be affected under this provision.

Burden Hours
14 mines X 0.35 hrs. X 3 sessions = 14.7 hrs.

Burden Cost
14.7 hrs. X $36 = $529

Certification Record:

Mine operators must prepare and retain a certification of retraining for each miner.

First Year Burden Hours and Cost

Small Coal Mines (<20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time to certify the date and type of training and to maintain a certification. There are 964 miners in small coal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
964 miners X 0.05 hrs. = 48.2 hrs.

Burden Cost
48.2 hrs. X $17 = $819

Large Coal Mines (≥20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time to certify the date and type of training and to maintain a certification. There are 5,179 miners in large coal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
5,179 miners X 0.05 hrs. = 258.95 hrs.
Burden Cost
258.95 hrs. X $17 = $4,402

Small Metal/Nonmetal Mines (<20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time to certify the date and type of training and to maintain a certification. There are 3,634 miners in small metal/nonmetal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
3,634 miners X 0.05 hrs. = 181.7 hrs.
Burden Cost
181.7 hrs. X $17 = $3,089

Large Metal/Nonmetal Mines (≥20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time per miner to certify the date and type of training and to maintain a certification. There are 6,532 miners in large metal/nonmetal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
6,532 miners X 0.05 hrs. = 326.6 hrs.
Burden Cost
326.6 hrs. X $17 = $5,552

Annual Burden Hours and Annual Burden Cost After First Year
Small Coal Mines (<20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time per miner to certify the date and type of training and to maintain a certification. There are 147 miners in small coal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
147 miners X 0.05 hrs. = 7.35 hrs.
Burden Cost
7.35 hrs. X $17 = $125

Large Coal Mines (≥20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time per miner to certify the date and type of training and to maintain a certification. There are 832 miners in large coal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
832 miners X 0.05 hrs. = 41.6 hrs.
Burden Cost
41.6 hrs. X $17 = $707

Small Metal/Nonmetal Mines (<20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time per miner to certify the date and type of training and to maintain a certification. There are 553 miners in small metal/nonmetal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
553 miners X 0.05 hrs. = 27.65 hrs.
Burden Cost
27.65 hrs. X $17 = $470

Large Metal/Nonmetal Mines (≥20)

MSHA estimates that this task will require three minutes (0.05 hrs.), per miner, of a clerical worker's time per miner to certify the date and type of training and to maintain a certification. There are 1,048 miners in large metal/nonmetal mines. A clerical worker's hourly wage rate is $17.

Burden Hours
1,048 miners X 0.05 hrs. = 52.4 hrs.
Burden Cost
52.4 hrs. X $17 = $891

§62.175 Notification of Results; Reporting Requirements

Notification to Miners of Audiometric Test Results:
The mine operator must notify the miner in writing of the results and interpretation of the audiometric test, the need and reasons for any further testings, and when an evaluation of an audiogram shows that a miner has incurred a reportable hearing loss. The mine operator must report such hearing loss to MSHA.

First Year Burden Hours and Costs
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 9,613 affected miners working in 1,710 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
1,710 mines X 0.1 hrs. = 171 hrs.
9,613 miners X 0.08 hrs. = 769.04 hrs.
Burden Costs
171 hrs. X $43 = $7,353
769.04 hrs. X $17 = $13,074

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 51,145 affected miners working in 892 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
892 mines X 0.1 hrs. = 89.2 hrs.
51,145 miners X 0.08 hrs. = 4,091.6 hrs.
Burden Costs
89.2 hrs. X $43 = $3,836
4,091.6 hrs. X $17 = $69,557

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will

take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 36,245 affected miners working in 6,776 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
6,776 mines X 0.1 hrs. = 677.6 hrs.
36,245 miners X 0.08 hrs. = 2,899.6 hrs.
Burden Costs
677.6 hrs. X $36 = $24,394
2,899.6 hrs. X $17 = $49,293

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 64,518 affected miners working in 1,098 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
1,098 mines X 0.1 hrs. = 109.8 hrs.
64,518 miners X 0.08 hrs. = 5,161.44 hrs.
Burden Costs
109.8 hrs. X $36 = $3,953
5,161.44 hrs. X $17 = $87,744

Annual Burden Hours and Annual Burden Costs After First Year
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 1,442 affected miners working in 257 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
257 mines X 0.1 hrs. = 25.7 hrs.
1,442 miners X 0.08 hrs. = 115.36 hrs.
Burden Costs
25.7 hrs. X $43 = $1,105
115.36 hrs. X $17 = $1,961

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 7,672 affected miners working in 134 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
134 mines X 0.1 hrs. = 13.4 hrs.
7,672 miners X 0.08 hrs. = 613.76 hrs.
Burden Costs
13.4 hrs. X $43 = $576
613.76 hrs. X $17 = $10,434

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 5,437 affected miners working in 1,016 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
1,016 mines X 0.1 hrs. = 101.6 hrs.
5,437 miners X 0.08 hrs. = 434.96 hrs.
Burden Costs
101.6 hrs. X $36 = $3,658
434.96 hrs. X $17 = $7,394

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.), per miner, for a clerical worker to notify the miner. There are 9,678 affected miners working in 165 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
165 mines X 0.1 hrs. = 16.5 hrs.
9,678 miners X 0.08 hrs. = 774.24 hrs.
Burden Costs
16.5 hrs. X $36 = $594
774.24 hrs. X $17 = $13,162

Notifying Miners of Need and Reasons for any Further Testing:
First Year Burden Hours and Costs
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 961 affected miners working in 161 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
161 mines X 0.1 hrs. = 16.1 hrs.
961 miners X 0.08 hrs. = 76.88 hrs.
Burden Costs
16.1 hrs. X $43 = $692
76.88 hrs. X $17 = $1,307

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 5,114 affected miners working in 71 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
71 mines X 0.1 hrs. = 7.1 hrs.
5,114 miners X 0.08 hrs. = 409.12 hrs.
Burden Costs
7.1 hrs. X $43 = $305
409.12 hrs. X $17 = $6,955

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 3,624 affected miners working in 644 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
644 mines X 0.1 hrs. = 64.4 hrs.
3,624 miners X 0.08 hrs. = 289.92 hrs.

Burden Costs
64.4 hrs. X $36 = $2,318
289.92 hrs. X $17 = $4,929

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 6,452 affected miners working in 88 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
88 mines X 0.1 hrs. = 8.8 hrs.
6,452 miners X 0.08 hrs. = 516.16 hrs.
Burden Costs
8.8 hrs. X $36 = $317
516.16 hrs. X $17 = $8,775

Annual Burden Hours and Annual Burden Costs After First Year
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 144 affected miners working in 24 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
24 mines X 0.1 hrs. = 2.4 hrs.
144 miners X 0.08 hrs. = 11.52 hrs.
Burden Costs
2.4 hrs. X $43 = $103
11.52 hrs. X $17 = $196

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 767 affected miners working in 11 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours

11 mines X 0.1 hrs. = 1.1 hrs.
767 miners X 0.08 hrs. = 61.36 hrs.
Burden Costs
1.1 hrs. X $43 = $47
61.36 hrs. X $17 = $1,043

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying the miner. The clerical will take about 4.8 minutes (0.08 hrs.) for a clerical worker to notify the miner. There are 544 affected miners working in 97 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
97 mines X 0.1 hrs. = 9.7 hrs.
544 miners X 0.08 hrs. = 43.52 hrs.
Burden Costs
9.7 hrs. X $36 = $349
43.52 hrs. X $17 = $740

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 968 affected miners working in 13 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
13 mines X 0.1 hrs. = 1.3 hrs.
968 miners X 0.08 hrs. = 77.44 hrs.
Burden Costs
1.3 X $36 = $47
77.44 hrs. X $17 = $1,316

Notifying Miners of Results of Follow-up Examinations:
First Year Burden Hours and Costs
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 51 affected

miners working in 8 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
8 mines X 0.1 hrs. = 0.8 hrs.
51 miners X 0.08 hrs. = 4.08 hrs.
Burden Costs
0.8 hrs. X $43 = $34
4.08 hrs. X $17 = $69

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 320 affected miners working in 4 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
4 mines X 0.1 hrs. = 0.4 hrs.
320 miners X 0.08 hrs. = 25.6 hrs.
Burden Costs
0.4 hrs. X $43 = $17
25.6 hrs. X $17 = $435

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 191 affected miners working in 34 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
34 mines X 0.1 hrs. = 3.4 hrs.
191 miners X 0.08 hrs. = 15.28
18.68 hrs.
Burden Costs
3.4 hrs. X $36 = $122
15.28 hrs. X $17 = $260

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions

to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 403 affected miners working in 5 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
5 mines X 0.1 hrs. = 0.5 hrs.
403 miners X 0.08 hrs. = 32.24 hrs.
Burden Costs
0.5 hrs. X $36 = $18
32.24 hrs. X $17 = $548

Annual Burden Hours and Annual Burden Costs After First Year
Small Coal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 8 affected miners working in 1 small coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. = 0.1 hrs.
8 miners X 0.08 hrs. = 0.64 hrs.
Burden Costs
0.1 hrs. X $43 = $4
0.64 hrs. X $17 = $11

Large Coal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 48 affected miners working in 1 large coal mines. The hourly wage rate for a coal mine supervisor is $43 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. = 0.1 hrs.
48 miners X 0.08 hrs. = 3.84 hrs.
Burden Costs
0.1 hrs. X $43 = $4
3.84 hrs. X $17 = $65

Small Metal/Nonmetal Mines (<20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 29 affected miners working in 5 small metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
5 mines X 0.1 hrs. = 0.5 hrs.
29 miners X 0.08 hrs. = 2.32 hrs.
Burden Costs
0.5 hrs. X $36 = $18
2.32 hrs. X $17 = $39

Large Metal/Nonmetal Mines (≥20)

MSHA anticipates that it will take an average of 6 minutes (0.1 hrs.), per mine, for a mine supervisor to give instructions to a clerical worker about notifying miners of their follow-up examination results. The clerical worker will take about 4.8 minutes (0.08 hrs.) to notify the miner. There are 60 affected miners working in 1 large metal/nonmetal mines. The hourly wage rate for a coal mine supervisor is $36 and for a clerical worker is $17.

Burden Hours
1 mine X 0.1 hrs. = 0.1 hrs.
60 miners X 0.08 hrs. = 4.8 hrs.
Burden Costs
0.1 hrs. X $36 = $4
4.8 hrs. X $17 = $82

§62.180 Training

The final rule requires that mine operators provide noise training to those miners with noise exposures that equal or exceed the action level of a TWA_8 of 85 dBA. In addition, mine operators have to certify and file the training certification.

Noise Training:
Annual Burden Hours and Costs
Small Coal Mines (<20)

Mine supervisors will spend 21 minutes (0.35 hrs.) on noise training per session to train affected miners. There will be one training session per mine. The provision would affect 1,710 small coal mines. A mine supervisor's hourly wage is $43.

Burden Hours
1,710 mines X 0.35 hrs. X 1 session = 598.5 hrs.
Burden Cost
598.5 hrs. X $43 = $25,736

Large Coal Mines (≥20)

Mine supervisors will spend 21 minutes (0.35 hrs.) on noise training per session to train affected miners. There will be three training sessions per mine. The provision would affect 803 large coal mines. A mine supervisor's hourly wage is $43.

Burden Hours
803 mines X 0.35 hrs. X 3 sessions = 843.15 hrs.
Burden Cost
843.15 hrs. X $43 = $36,255

Small Metal/Nonmetal Mines (<20)

Mine supervisors will spend 21 minutes (0.35 hrs.) on noise training per session to train affected miners. There will be one training session per mine. The provision would affect 6,776 small metal/nonmetal mines. A mine supervisor's hourly wage is $36.

Burden Hours
6,776 mines X 0.35 hrs. X 1 session = 2,371.6 hrs.
Burden Cost
2,371.6 hrs. X $36 = $85,378

Large Metal/Nonmetal Mines (≥20)

Mine supervisors will spend 21 minutes (0.35 hrs.) on noise training per session to train affected miners. There will be three training sessions per mine. The provision would affect 988 large metal/nonmetal mines. A mine supervisor's hourly wage is $36.

Burden Hours
988 mines X 0.35 hrs. X 3 sessions = 1,037.4 hrs.
Burden Cost
1,037.4 hrs. X $36 = $37,346

Preparing and Filing a Training Certificate:
Annual Burden Hours and Costs
Small Coal Mines (<20)

It will take 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about preparing and filing a training certificate. A clerical worker will take 3 minutes (0.05 hrs.), per miner, to prepare and file the training certification. There are 10,215 miners in 1,710 small mines. A mine supervisor makes $43 per hour and a clerical worker makes $17 per hour.

Burden Hours
1,710 mines X 0.1 hrs. = 171 hrs.
10,215 miners X 0.05 hrs. = 510.75 hrs.
Burden Costs
171 hrs. X $43 = $7,353
510.75 hrs. X $17 = $8,683

Large Coal Mines (≥20)

It will take 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about preparing and filing a training certificate. A clerical worker will take 3 minutes (0.05 hrs.), per miner, to prepare and file the training certification. There are 64,646 miners in 892 large mines. A mine supervisor makes $43 per hour and a clerical worker makes $17 per hour.

Burden Hours
892 mines X 0.1 hrs. = 89.2 hrs.
64,646 miners X 0.05 hrs. = 3,232.3 hrs.
Burden Costs
89.2 hrs. X $43 = $3,836
3,232.3 hrs. X $17 = $54,949

Small Metal/Nonmetal Mines (<20)

It will take 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about preparing and filing a training certificate. A clerical worker will take 3 minutes (0.05 hrs.), per miner, to prepare and file the training certification. There are 38,153 miners in 6,776 small mines. A mine supervisor makes $36 per hour and a clerical worker makes $17 per hour.

Burden Hours
6,776 mines X 0.1 hrs. = 677.6 hrs.
38,153 miners X 0.05 hrs. = 1,907.65 hrs.
Burden Costs
677.6 hrs. X $36 = $24,394
1,907.65 hrs. X $17 = $32,430

Large Metal/Nonmetal Mines (≥20)

It will take 6 minutes (0.1 hrs.) per mine for a mine supervisor to give instructions to a clerical worker about preparing and filing a training certificate. A clerical worker will take 3 minutes (0.05 hrs.), per miner, to prepare and file the training certification. There are 80,647 miners in 1,098 large mines. A mine supervisor makes $43 per hour and a clerical worker makes $17 per hour.

Burden Hours
1,098 mines X 0.1 hrs. = 109.8 hrs.
80,647 miners X 0.05 hrs. = 4,032.35 hrs.
Burden Costs
109.8 hrs. X $36 = $3,953
4,032.35 hrs. X $17 = $68,550

§62.190 Records

Access to Records:

The final rule requires that mine operators provide noise records at no charge to those miners who request copies of records. It takes 6 minutes (0.1 hrs.) for a mine supervisor to instruct a clerical worker about locating and photocopying miners' records. The clerical worker has to spend 9 minutes (0.15 hrs.) to locate and photocopy each miner's records.

Annual Burden Hours and Costs

Small Coal Mines(<20)

There are 695 affected miners working in 116 small coal mines. The hourly wage rate for a supervisor is $43 and $17 for a clerical worker.

Burden Hours
116 mines X 0.1 hrs. = 11.6 hrs.
695 miners X 0.15 hrs. = 104.25 hrs.
Burden Costs
11.6 hrs. X $43 = $499
104.25 hrs. X $17 = $1,772

Large Coal Mines(<20)

There are 1,875 affected miners working in 26 large coal mines. The hourly wage rate for a supervisor is $43 and $17 for a clerical worker.

Burden Hours
26 mines X 0.1 hrs. = 2.6 hrs.
1,875 miners X 0.15 hrs. = 281.25 hrs.
Burden Costs
2.6 hrs. X $43 = $112
281.25 hrs. X $17 = $4,781

Small Metal/Nonmetal Mines(<20)

There are 4,731 affected miners working in 840 small metal/nonmetal mines. The hourly wage rate for a supervisor is $36 and $17 for a clerical worker.

Burden Hours
840 mines X 0.1 hrs. = 84 hrs.
4,731 miners X 0.15 hrs. = 709.65 hrs.
Burden Costs
84 hrs. X $36 = $3,024
709.65 hrs. X $17 = $12,064

Large Metal/Nonmetal Mines(≤20)

There are 5,968 affected miners working in 81 large metal/nonmetal mines. The hourly wage rate for a supervisor is $36 and $17 for a clerical worker.

Burden Hours
81 mines X 0.1 hrs. = 8.1 hrs.
5,968 miners X 0.15 hrs. = 895.2 hrs.
Burden Cost
8.1 hrs. X $36 = $292
895.2 hrs. X $17 = $15,218

Transfer:

The mine operator must transfer all records to a successor mine operator. It takes 6 minutes (0.1 hrs.) for a mine supervisor to give instructions to a clerical worker about transferring all records. Compiling the records will take about 30 minutes (0.5 hrs.) of clerical worker's time at a small mine and about 1 hour at a large mine.

Annual Burden Hours and Costs
Small Coal Mines(<20)

There are 214 mines that will be affected annually. The hourly wage rate for a supervisor is $43 and $17 for a clerical worker.

Burden Hours
214 mines X 0.1 hrs. = 21.4 hrs.
214 mines X 0.5 hrs. = 107 hrs.
Burden Costs
21.4 hrs. X $43 = $920
107 hrs. X $17 = $1,819

Large Coal Mines (≥20)

There are 17 mines that will be affected annually. The hourly wage rate for a supervisor is $43 and $17 for a clerical worker.

Burden Hours
17 mines X 0.1 hrs. = 1.7 hrs.
17 mines X 1 hrs. = 17 hrs.
Burden Costs
1.7 hrs. X $43 = $73
17 hrs. X $17 = $289

Small Metal/Nonmetal mines (<20)

There are 393 mines that will be affected annually. The hourly wage rate for a supervisor is $36 and $17 for a clerical worker.

Burden Hours
393 mines X 0.1 hrs. = 39.3 hrs.
393 mines X 0.5 hrs. = 196.5 hrs.
Burden Costs
369.3 hrs. X $36 = $1,415
196.5 hrs. X $17 = $3,340

Large Metal/Nonmetal Mines (≥20)

There are 11 mines that will be affected annually. The hourly wage rate for a supervisor is $36 and $17 for a clerical worker.

Burden Hours
11 mines X 0.1 hrs. = 1.1 hrs.
11 mines X 1 hrs. = 11 hrs.
Burden Costs
1.1 hrs. X $36 = $40
11 hrs. X $17 = $187

VIII. ENDNOTES

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6. *Ibid*. pp. 160-163.

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8. U.S. Department of Energy/Energy Information Agency, Annual Energy Review 1997, DOE/EIA-0384(97), pp. 191,193, and 203.

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15. U.S. Department of Interior/U.S. Geological Survey, Mineral Commodity Summaries 1998, 1998, pp.52-53.

16. *Ibid*. pp. 18-19.

17. *Ibid*. pp. 70-71.

18. *Ibid*. pp. 84-85.

19. *Ibid*. pp. 142, 143, 156, and 157.

20. *Ibid*. p. 124-125.

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