

FINAL REGULATORY ECONOMIC ANALYSIS

for

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Hazard Communication (HazCom)

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I. EXECUTIVE SUMMARY

INTRODUCTION

This Regulatory Economic Analysis (REA) addresses the benefits and compliance costs associated with our (MSHA's) final hazard communication (HazCom) rule. The HazCom rule is being promulgated in order to increase knowledge and awareness of chemical hazards in the coal and metal and nonmetal (M/NM) mining industries.

The major provisions of the final rule require operators (mine operators and independent contractors covered by the rule) to: (1) identify chemicals at the mine and determine if they present a physical or health hazard to miners; (2) develop, implement, and maintain a written HazCom program; (3) label containers of hazardous chemicals to identify them as hazardous chemicals and provide appropriate hazard warnings; (4) have a Material Safety Data Sheet (MSDS) for each hazardous chemical at the mine; (5) establish a training program which ensures that miners understand the hazardousness of each chemical in their work area; and (6) provide miners, designated representatives, and customers access to written materials that are part of the HazCom program.

Sections 101 and 115 of the Federal Mine Safety and Health Act of 1977 provide the authority for this rulemaking. Executive

Order 12866 requires that regulatory agencies complete a Regulatory Economic Analysis (REA) for any rule having major economic consequences for the national economy, an individual industry, a geographic region, or a level of government. The Regulatory Flexibility Act (RFA) similarly requires regulatory agencies to consider the impact of the rule on small entities. This final REA and regulatory flexibility certification have been prepared to fulfill the requirements of Executive Order 12866 and the RFA. We have determined that the HazCom rule will not result in major cost increases nor have an effect of \$100 million or more annually on the economy. We further certify that the HazCom rule will not impose a significant economic impact on a substantial number of small entities.

NEED FOR THE HAZCOM RULE¹

One of the conditions underlying the economists' model of an idealized market system is full information—that is, that the market participants are fully informed of their options. Applied to the job market, this means that workers and employers must know the consequences of any decisions they might make, including the associated workplace risks, in order to negotiate to best advantage. Workers unaware of job hazards would not seek

¹ The discussion in this section draws on material in Ashford, Nicholas A., and Caldart, Charles C., Technology, Law, and the Working Environment, Washington, D.C.: Island Press, 1996, pp. 229-241.

compensation for the risks they bear (and their wages would not reflect those risks); consequently, employers would have insufficient incentives to invest in safer working conditions.

As a practical matter, the attainment of full risk information consists of a three-stage process: the information must exist or be created; it must be obtained by the affected parties; and they must be able to understand the information they receive.

The job market may function adequately in response to some occupational *safety* risks. For example, workers can reason that activities involving dynamite and other recognized explosive materials are inherently dangerous.² In addition, workers are often able to develop some, albeit limited, knowledge of the workplace safety hazards confronting them from their own and their coworkers' on-the-job injury experience.³

It is in the area of occupational *disease* that informational deficiencies most seriously compromise the performance of the job market. Whereas the relationship between an occupational

²By comparison, workers may be unaware of the risks of acute injury posed by many chemicals because the hazardous properties of those chemicals (e.g., toxic, reactive, explosive) or the conditions under which the chemicals are hazardous (e.g. skin contact, heat) may not be obvious.

³Also, for certain safety hazards, such as explosives, the economic interests of the employer may dictate taking preventative action even if workers were unaware of the risks, since an explosion would damage or destroy the employer's property (and perhaps entire business). Such is not the case of chemical health hazards, however, since the workers' unrecognized risks of occupational disease are generally external to, and do not parallel, the employer's economic interests.

accident and the resultant injury is both obvious and immediate, the connection between the work environment and job-related disease generally is not. Most diseases have multiple potential causes and may be the result of synergistic effects, making it difficult to determine whether an individual's disease is job-related rather than an "ordinary disease of life" resulting from lifestyle, genetic, physiological, or other non-occupational environmental factors. This problem is compounded by the fact that there is frequently a long latency period—sometimes 20 years or more—between exposure to the occupational health hazard and the manifestation of the consequent disease. As a result, workers usually cannot rely on their knowledge or "intuition" to draw a connection between workplace conditions and a chronic disease, as would be the case for an acute injury.

MSHA's HazCom final rule is an information standard that will help to address the market failure in the job market due to imperfect information. It will provide needed information, both to operators and to miners, about chemical hazards present in their mine area: what chemicals are hazardous, the nature of the hazards and the associated risks of disease and injury, conditions under which the chemicals are hazardous, and steps that can be taken to protect miners from disease and injury due to exposure to the hazardous chemicals. The HazCom final rule does not in any way prohibit or limit the use of hazardous

chemicals or otherwise impose technological solutions or restrictions on mine operators. The final rule only assures that operators and miners are aware of the chemical hazards present in their mine area. With operators and miners in possession of this information, the job market will function more efficiently. As workers demand risk compensation for the (newly identified) hazards posed by workplace chemicals, operators will have an incentive to reduce or remove the chemical hazard.

MINING SECTORS AFFECTED

The final HazCom rule will be applicable to all underground and surface coal and M/NM mines. Therefore, the rule is applicable to 1,900 surface and underground coal mines; 2,837 coal contracting firms; 11,502 surface and underground M/NM mines; and 3,644 M/NM contracting firms.

BENEFITS

We conclude that miners face a significant risk from exposure to hazardous chemicals. We further conclude that compliance with this rule will prevent a substantial number of acute illnesses, injuries, and fatalities, as well as long-term cancer cases.

Based on our review and analysis of the available data, we have determined that, in terms of acute health effects,

compliance with this rule will prevent one fatality every four years beginning when the rule takes effect. Also, an annual average of 57 chemically-related miner acute injuries and illnesses will be prevented by compliance with this rule. About 15 of these 57 will be prevented in coal mines while another 42 will be prevented in M/NM mines. Of the 57 prevented chemically-related acute injuries and illnesses, 32 will be lost workday injuries and illnesses involving 392 lost workdays, and 25 will be non-lost workday injuries and illnesses.

In addition, to the one acute fatality saved every four years noted above, we expect the final rule will prevent a total of 50 cancer deaths, 16 in coal operations and 34 in M/NM operations, from year 11 through year 20 after promulgation and an additional 9 cancer deaths every year thereafter.

These benefits are discussed in greater detail in Chapter III of this REA.

COMPLIANCE COSTS

We estimate that compliance with the final rule will cost about \$7.8 million yearly, \$5.5 million for the M/NM mining industry and \$2.3 million for the coal mining industry.

For the purpose of the cost analysis, we used our traditional definition of a small mine: one employing fewer than 20 miners. Based on 2000 data, the final rule will cover about

19,900 operators, including independent contractors. Of this total, about 16,500 (or 83 percent) employ fewer than 20 miners. The estimated total yearly cost of complying with the final rule will be \$4.3 million for small M/NM operators and \$1.4 million for small coal operators. Table IV-1, in Chapter IV of this REA, summarizes the estimated yearly compliance costs of the final rule by mine size and by provision. For the mining industry as a whole, these estimates reflect first-year compliance costs of \$31.6 million and compliance costs of \$6.1 million for the second year and each succeeding year.

We have determined that compliance by the mining industry with the requirements of the final rule is both technologically and economically feasible. Although we informally considered the benefits and cost burdens of dozens of alternative provisions of the HazCom rule, we have not conducted a formal analysis of alternatives to a HazCom rule because we did not identify any that would effectively prevent or reduce miner exposure to chemical hazards.

EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

Executive Order (E.O.) 12866 requires that regulatory agencies assess both the costs and benefits of intended regulations. We have fulfilled this requirement for the final rule and determined that it is not an economically significant

regulatory action pursuant to § 3(f)(1) of E.O. 12866. However, we determined that this final rule is significant under § 3(f)(4) of E.O. 12866, which defines a significant regulatory action as one that may "...raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order."

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, we must use the Small Business 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, we establish an alternative definition for a small mine and publish that definition in the Federal Register for notice and comment. For the mining industry, SBA defines "small" as a mine with 500 or fewer workers. We traditionally have considered small mine operators to be those with fewer than 20 workers. To ensure that the final HazCom rule conforms with the RFA, we have analyzed its economic impact on mine operators with 500 or fewer workers, as well as on those with fewer than 20 workers.

We have determined that the final HazCom rule will not have a significant economic impact on small coal or M/NM mine operators, whether a small mine operator is defined as one with 500 or fewer workers or one with fewer than 20 workers.

Using the Agency's traditional definition of a small mine operator, which is one employing fewer than 20 workers, the estimated yearly cost of the final HazCom rule on small coal mine operators will be about \$1.4 million. Using SBA's definition of a small mine operator, which is one employing 500 or fewer workers, the estimated yearly cost of the final HazCom rule on small coal mine operators will be about \$2.3 million. These cost figures compare to estimated annual revenues of approximately \$0.6 billion for coal mine operators employing fewer than 20 workers, and about \$15.1 billion for coal mine operators employing 500 or fewer workers.

Using the Agency's traditional definition of a small mine operator, which is one employing fewer than 20 workers, the estimated yearly cost of the final HazCom rule on small M/NM mine operators will be about \$4.3 million. Using SBA's definition of a small mine operator, which is one employing 500 or fewer workers, the estimated yearly cost of the final HazCom rule on small M/NM mine operators will be about \$5.5 million. These cost figures compare to estimated annual revenues of approximately \$8.4 billion for M/NM mine operators that employ fewer than 20 workers, and about \$36.8 billion for M/NM mine operators employing 500 or fewer workers.

Based on our analysis, we have determined that the final HazCom rule will not have a significant economic impact on a

substantial number of small entities. We have so certified these findings to the Small Business Administration. The factual basis for this certification is discussed in Chapter V of this REA.

II. INDUSTRY PROFILE

INTRODUCTION

This industry profile provides background information about the structure and economic characteristics of the mining industry. It provides data on the number of mines, their size, and the number of workers they employ.

THE STRUCTURE OF THE MINING INDUSTRY

We divide the mining industry into two major segments based on commodity: (1) coal mines and (2) metal and nonmetal (M/NM) mines. These segments are further divided based on type of operation (e.g., underground mines or surface mines). We maintain our own data on mine type, size, and employment, and we also collect data on the number of independent contractors and contractor employees by major industry segment.

We categorize mines by size based on employment. For the past 20 years, for rulemaking purposes, we have consistently defined a small mine to be one that employs fewer than 20 workers and a large mine to be one that employs 20 or more workers. However, to comply with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), we must use the Small Business Administration's (SBA's) criteria for a small entity when

determining a rule's economic impact. For the mining industry, SBA defines a small entity as one which employs 500 or fewer employees.

Table II-1 presents the total number of small and large mines and the corresponding number of miners, excluding contractors and office workers, for the coal mining segment in 2000. This table uses three mine size categories based on the number of employees: (1) fewer than 20 employees (our traditional definition of small), (2) 20 to 500 employees (small according to SBA's definition, but not MSHA's), and (3) more than 500 employees.

Table II-2 presents corresponding data on the number of

Table II-1: Distribution of Operations and Employment (Excluding Contractors) by Mine Type and Size; Coal, 2000

Mine Type	Size of Coal Mine						All Coal Mines	
	< 20 Employees		20 to 500* Employees		> 500* Employees			
	Mines	Employees	Mines	Employees	Mines	Employees	Mines	Employees
Underground	268	2,586	393	31,896	3	1,651	664	36,133
Surface	835	5,191	398	25,375	3	1,661	1,236	32,227
Total Coal	1,103	7,777	791	57,271	6	3,312	1,900	68,360

(*) Based on MSHA's traditional definition, large mines include all mines with 20 or more employees.

Source: Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

independent contractors and their employees working in the coal mining segment in 2000.

**Table II-2: Distribution of Contractors and Contractor Employment
by Size of Operation; Coal, 2000**

Contractors	Size of Contractor, Coal						All Contractors	
	< 20 Employees		20 to 500* Employees		> 500* Employees			
	Firms	Employees	Firms	Employees	Firms	Employees	Firms	Employees
Underground	769	3,085	86	4,703	0	0	855	7,788
Surface	1,717	7,541	263	13,224	2	1,025	1,982	21,790
Total Contractors	2,486	10,626	349	17,927	2	1,025	2,837	29,578

(*) Based on MSHA's traditional definition, large contractors include contractors with 20 or more employees.

Source: Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

Table II-3 presents the total number of small and large mines and the corresponding number of miners, excluding office workers and contractors, for the M/NM mining segment in 2000. The M/NM mining segment consists of metal mines (copper, iron ore, gold, silver, etc.) and nonmetal mines (stone including granite, limestone, dolomite, sandstone, slate, and marble; sand and gravel; and others such as clays, potash, soda ash, salt, talc, and pyrophyllite.) As Table II-3 indicates, about 98 percent of all M/NM mines are surface mines and employ some 90 percent of all M/NM miners, excluding office workers. Almost all M/NM mines are small according to SBA's definition (500 or fewer employees).

**Table II-3: Distribution of Operations and Employment (Excluding Contractors)
by Mine Type and Size; M/NM, 2000**

Mine Type	Size of M/NM Mine						All M/NM Mines	
	< 20 Employees		20 to 500* Employees		> 500* Employees			
	Mines	Employees	Mines	Employees	Mines	Employees	Mines	Employees
Underground	99	861	125	11,833	5	3,375	229	16,069
Surface	9,634	49,988	1,621	78,765	18	15,681	11,273	144,434
Total M/NM	9,733	50,849	1,746	90,598	23	19,056	11,502	160,503

(*) Based on MSHA's traditional definition, large mines include all mines with 20 or more employees.

Source: Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

Table II-4 presents corresponding data on the number of independent contractors and their employees working in the M/NM mining segment in 2000.

**Table II-4: Distribution of Contractors and Contractor Employment
by Size of Operation; M/NM, 2000**

Contractors	Size of Contractor, M/NM						All Contractors	
	< 20 Employees		20 to 500* Employees		> 500* Employees			
	Firms	Employees	Firms	Employees	Firms	Employees	Firms	Employees
Underground	395	1,661	45	2,274	0	0	440	3,935
Surface	2,752	13,691	447	24,940	5	3,659	3,204	42,290
Total Contractors	3,147	15,352	492	27,214	5	3,659	3,644	46,225

(*) Based on MSHA's traditional definition, large contractors include all contractors with 20 or more employees.

Source: Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

ECONOMIC CHARACTERISTICS

The value of the U.S. mining industry's 2000 coal and M/NM production was estimated at about \$57.9 billion, or 0.6 percent of Gross Domestic Product (GDP). Coal mining contributed about \$17.7 billion to the GDP, and M/NM mining, about \$40.2 billion.⁴ Some \$9.9 billion were contributed by the metal mining subsector while the remaining \$30.3 billion were provided by the nonmetal or industrial mineral mining subsector. Recycled metal and mineral materials (scrap iron, aluminum, glass, etc.) accounted for an additional \$15 billion.⁵

STRUCTURE OF THE COAL MINING SEGMENT

Agency data indicate that there were about 1,900 coal mines in 2000. When applying our own definition of a small mine (fewer than 20 workers), 1,103 (about 58 percent) were small mines and 79 (about 42 percent) were large.⁶ Using SBA's definition, only 6 coal mines (0.3 percent) were large.

These data show that employment at coal mines in 2000 was about 60,583, of which about 7,777 (11 percent) worked at small mines and 78,900 (89 percent) worked at large mines, based on our

⁴ U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2001, January 2001, p. 7.

⁵ U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2001, January 2001, p. 4.

⁶ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

own definition of small and large mines.⁷ Using SBA's definition, about 95 percent of coal miners worked at small mines and about 5 percent worked at large mines. We estimate that, on average, each small coal mine employs 7 workers and each large coal mine employs 76 workers, based on our own definition. Using SBA's definition, there are, on average, 34 workers in each small coal mine and 552 workers in each large coal mine.

ECONOMIC CHARACTERISTICS OF THE COAL MINING SECTOR

We classify the U.S. coal mining segment into two major commodity groups: bituminous and anthracite. About 91 percent of total coal production is bituminous. The remaining 9 percent is the product of lignite and anthracite mines.⁸

Mines east of the Mississippi accounted for about 47 percent of coal production in 2000. For the period 1949 through 1998, 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; 2000 production was estimated at 509.3 million tons. During this same period, however, coal production west of the Mississippi increased considerably from a low of 20 million tons in 1959 to a record high of 570.9 million

⁷ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

⁸ U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, p. 201.

tons in 1999.⁹ The growth in western coal has been due, in part, to environmental concerns that led to increased demand for low-sulfur coal, which is in abundance in the West.

In addition, surface mining, with its higher average productivity, is much more prevalent in the West. Surface mining methods for coal, which include drilling and blasting, are also practiced in surface mines for other commodity types. Most surface mines use front-end loaders, bulldozers, shovels, or trucks for haulage.

The U.S. coal sector produced 1.05 billion short tons of coal in 2000, at an average price of \$16.78 per ton. The total value of U.S. coal production in 2000 was estimated at \$17.7 billion. Based on our own definition of small and large mines, small mines produced about 3 percent (35 million tons) of domestic coal production valued at \$0.6 billion, and large mines produced about 97 percent (1.02 billion tons) valued at \$17.1 billion.¹⁰

⁹ U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, p. 201.

¹⁰ U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p. 206, and Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

The U.S. coal industry enjoys a fairly constant domestic demand. Over 90 percent of U.S. coal demand was accounted for by electric utilities in 1998.¹¹

STRUCTURE OF THE METAL/NONMETAL MINING SECTOR

The M/NM mining sector consists of about 80 different commodities including industrial minerals. There were about 11,502 M/NM mines in the U.S. in 2000, of which 9,733 (85 percent) were small mines and 1,769 (15 percent) were large mines, using our traditional definition of small and large mines. However, based on SBA's definition, only 23 (0.2 percent) were large mines.¹²

These data indicate employment at M/NM mines in 2000 was about 160,503, of which about 50,849 miners (32 percent) worked at small mines and 109,654 miners (68 percent) worked at large mines, using our definition. Based on SBA's definition, however, about 141,447 miners (88 percent) worked at small mines and 19,056 miners (12 percent) worked at large mines. Using our own definition, the average employment is 5 miners at a small M/NM

¹¹ U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, p. 203.

¹² Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

mine and 62 miners at a large M/NM mine.¹³ Using SBA's definition, there are, on average, 12 workers in each small M/NM mine and 828 workers in each large M/NM mine.

Metal Mining

There are about 24 metal commodities mined in the U.S. Underground metal mines use a few basic mining methods, such as room and pillar and block caving. The larger mines rely more on hydraulic drills and track-mounted haulage, and the smaller underground metal mines rely more on hand-held pneumatic drills. Surface metal mines normally engage in drilling, blasting, and hauling; such processes are typical in all surface mines, irrespective of commodity types. Surface metal mines in the U.S. rank among some of the largest mines in the world.

Metal mines constitute about 2 percent of all M/NM mines and employ about 21 percent of all M/NM miners. Under our traditional definition of a small mine, about 44 percent of metal mines are small and employ about 2 percent of all miners working in metal mines. Using SBA's definition, about 93 percent of

¹³ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

metal mines are small and employ about 53 percent of all miners working in metal mines.¹⁴

Nonmetal Mining

For enforcement and statistical purposes, MSHA separates stone and sand and gravel mining from other nonmetal mining. There are about 35 other nonmetal commodities, not including stone, and sand and gravel. Nonmetal mining uses a wide variety of underground mining methods such as continuous mining (similar to coal mining), in-situ retorting, block caving, and room and pillar. The mining method is dependent on the geologic characteristics of the ore and host rock. Some nonmetal operations use kilns and dryers in ore processing. Ore crushing and milling are processes common to both nonmetal and metal mining.

As with underground mining, there is a wide range of mining methods utilized in extracting minerals by surface mining. In addition to drilling and blasting, other mining methods, such as evaporation and dredging, are also used, depending on the ore formation.

Nonmetal mines comprise about 7 percent of all M/NM mines and employ about 14 percent of all M/NM miners. Using our own

¹⁴ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

definition of a small mine, about 68 percent of nonmetal mines are small and employ about 12 percent of all miners working in nonmetal mines. Using SBA's definition, about 99 percent of nonmetal mines are small and employ about 88 percent of all miners working in nonmetal mines.¹⁵

Stone Mining

In the stone mining subsector, there are eight different stone commodities, of which seven are further classified as either dimension stone or crushed and broken stone. Stone mining in the U.S. is predominantly by quarrying, with only a few slight variations. Crushed stone mines typically drill and blast, while dimension stone mines generally use channel burners, drills, or wire saws. Diesel powered-haulage is used to transfer the broken rock from the quarry to the mill where crushing and sizing are done.

Stone mines constitute about 34 percent of all M/NM mines, and employ about 43 percent of all M/NM miners. Using our own definition of a small mine, about 73 percent of stone mines are small and employ about 30 percent of all miners working in stone mines. Using SBA's definition, about 99.9 percent of stone mines

¹⁵ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

are small and employ about 99 percent of all miners working in stone mines.¹⁶

Sand & Gravel Mining

Sand and gravel, for construction, is generally extracted from surface deposits using dredges or draglines. Further preparation involves washing and screening. As in other surface mining operations, sand and gravel uses diesel-driven machines, such as front-end loaders, trucks, and bulldozers, for haulage. The preparation of industrial sand and silica flour involves the use of crushers, ball mills, vibrating screens, and classifiers.

The sand and gravel subsector represents the single largest commodity group in the U.S. mining industry when the number of mining operations is being considered. Sand and gravel mines comprise about 57 percent of all M/NM mines, and employ about 22 percent of all M/NM miners. Using our own definition of a small mine, about 95 percent of sand and gravel mines are small and employ about 75 percent of all miners working in sand and gravel mines. Using SBA's definition, almost 100 percent of sand and gravel mines are small and employ approximately 35,898 miners.¹⁷

¹⁶ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

¹⁷ Calendar year 2000 data from U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources.

ECONOMIC CHARACTERISTICS OF THE METAL/NONMETAL MINING INDUSTRY

The value of all M/NM mining output in 2000 was estimated at \$40.2 billion.¹⁸ Metal mines, which include copper, gold, iron, lead, silver, tin, and zinc mines, contributed \$9.9 billion in 2000. Nonmetal production, stone mining, sand and gravel, and other nonmetals such as potash, clay, and salt were valued at \$30.3 billion.

The end uses of M/NM mining output are diverse. For example, iron and aluminum are used to produce vehicles and other heavy duty equipment, as well as consumer goods such as household equipment and soft drink cans. Other metals, such as uranium and titanium, have more limited uses. Nonmetals, like cement, are used in construction while salt is used as a food additive and for road de-icing in the winter. Soda ash, phosphate rock, and potash also have a wide variety of commercial uses. Stone and sand and gravel are used in numerous industries and extensively in the construction industry.

A detailed economic picture of the M/NM mining industry is difficult to develop because most mines are either privately held corporations or sole proprietorships, or subsidiaries of publicly

¹⁸ U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2001, January 2001, p. 7.

owned companies. Privately held corporations and sole proprietorships are not required to make their financial data available to the public. 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 M/NM companies, and these data are not representative of the entire industry.

III. BENEFITS

INTRODUCTION

We consider the promulgation of this final rule necessary to reduce injuries and illnesses arising from exposure to hazardous chemicals in the mining industry. To comply with this final rule, mine operators must evaluate the hazards of the chemicals they use and produce and provide information to miners about these chemical hazards by developing a written HazCom communication program; labeling containers of hazardous chemicals; providing access to MSDSs; and training miners.

With the information from the HazCom program, miners will be better able to (1) take precautions to prevent or minimize exposure to hazardous chemicals (including the proper use of the hazardous chemicals and the use of personal protective equipment, as appropriate); (2) seek effective medical treatment for injuries and illnesses arising from work-related chemical exposure; and (3) make demands for higher wages (to more accurately reflect the risks miners face from chemical hazards) unless the operator (a) reduces the number and amount of hazardous chemicals used in the mine, and (b) takes steps to prevent miner injury and disease from exposure to those hazardous chemicals remaining in the mine. The safety-conscious and cost-conscious operator will, in turn, remove unnecessary hazardous

chemicals from the mine; replace hazardous chemicals with more benign substitutes (as feasible and economic); and introduce measures to reduce miner exposure to those hazardous chemicals remaining in the mine. These protective measures should result in fewer miner fatalities, injuries, and illnesses from exposures to hazardous chemicals.

This chapter contains our analysis of the potential health and safety benefits associated with this final rule. We first present the available data concerning miner fatalities, injuries, and illnesses that are associated with exposures to hazardous chemicals in the mining environment. We then discuss and estimate the possible long-term cancer risk to mine workers. Finally, we estimate the potential benefits from compliance with this final rule.

METHODOLOGY

In order to estimate the potential benefits from full compliance with this rule, we first establish the baseline of existing injuries, illnesses, and fatalities from which the benefits are calculated. We next describe the potential types of adverse health effects associated with exposures to hazardous chemicals. We then discuss the databases used to estimate the numbers of employee fatalities, injuries, and illnesses associated with occupational exposures to hazardous chemicals.

Finally, we estimate the numbers of injuries, illnesses, acute fatalities, and cancer deaths that would be prevented by full compliance with this final rule.

In estimating the health and safety benefits of the HazCom final rule, we need to address two related methodological issues that could potentially limit the effectiveness of the rule.

The first issue involves the possible double-counting of benefits. One commenter on the interim final rule suggested that the majority of the benefits of the HazCom final rule are part of the benefits (10 fatalities and 550 injuries prevented) that MSHA already claimed for its 1999 part 46 training standard. However, those estimated benefits only reflected half of the additional injuries and fatalities in (then) exempted non-metal surface mines. There is no reason to believe that the estimated benefits of this HazCom final rule duplicate the estimated part 46 benefits. Indeed, many of the estimated HazCom benefits accrue to coal mines and non-exempted metal/nonmetal mines not covered by the 1999 part 46 training standard.

The second issue involves the possibility that HazCom provisions would replace other mine safety and health provisions—in particular that HazCom training would replace training on other mine hazards—with little or no net effect on the number of miner injuries, illnesses, and fatalities. This is a real, albeit limited, possibility for some operations under

certain circumstances, but we believe the effect on our estimates of benefits would be minimal, for the following reasons: (1) The possibility of MSHA provisions replacing other mine safety and health provisions would be limited to HazCom training, and would not apply to the program development, MSDS, labeling, and access provisions of the HazCom final rule. (2) Many operators will not be able to incorporate initial HazCom training into their existing part 46 or part 48 training program; for these operators, the initial HazCom training would be in addition to the hazard training already being provided. (3) The operators who incorporate initial HazCom training, and other HazCom training, into their existing part 46 or part 48 training program will typically be replacing other hazard training that is repeated year after year. (4) Those operators who believe HazCom training would be replacing other essential hazard training can choose to provide the HazCom training in addition to the other essential hazard training.

BASELINE

We use current industry practices as our baseline for estimating the numbers of chemically-related occupational fatalities, injuries, and illnesses potentially preventable by compliance with this rule. The mines whose current industry practices form the baseline include (1) mine operators and

independent contractors that have not established hazard communication programs, and (2) mines that have established hazard communication programs either (a) voluntarily (e.g., company policy), (b) in response to state employee right-to-know laws, or (c) in response to the Occupational Safety and Health Administration (OSHA) hazard communication rule. Because these existing hazard communication programs were developed in the absence of this rule, the fatalities, injuries, and illnesses being prevented as a result of these existing programs are not included in the estimated benefits attributable to this rule.

ADVERSE HEALTH EFFECTS ASSOCIATED WITH HAZARDOUS CHEMICALS The two types of potential adverse health effects associated with exposure to hazardous chemicals are (1) acute health effects and (2) chronic health effects.

An acute health effect is a fatality, injury, or illness that occurs immediately or shortly after an exposure to a hazardous chemical. Acute health effects can be mild or severe. They can also be temporary or permanent. An example of an acute health effect due to exposure to a hazardous chemical is poisoning from exposure to cyanide, which is used to separate gold (and other metals) from ore. Another example is a common chemical burn from physical contact with a chemical used in mining, such as wet cement or lime.

A chronic health effect is slow to develop, shows little change or progresses slowly, and continues for a long, drawn out period of time. In the mining industry, most chronic diseases involve a latency period of years after exposure to a hazardous chemical before the illness is evident. Most chronic health effects are consequences of long-term exposures to one or more hazardous chemicals. Chronic health effects are typically severe and permanent, although some are reversible. Some examples of chronic health effects due to exposure to hazardous substances in mining are cancer, heart disease, kidney disease, sterility, black lung disease, and silicosis.

Also, pre-existing conditions, such as respiratory or central nervous system disease, can be aggravated by exposure to certain chemicals. Miners with existing health conditions need to be aware of the potential additional hazard that exposure to chemicals presents to them.

The ability of mine operators to link occupational illnesses to chemical exposures is of particular concern. Misdiagnosis is a problem, and often symptoms are treated without realizing that the cause is an occupational chemical exposure. The Bureau of Labor Statistics (BLS) made note of this reporting disparity in one of their annual reports:

Some conditions (e.g., long-term latent illnesses caused by exposure to carcinogens) are often difficult to link to the workplace and, therefore, may not be recognized and reported.¹⁹

Proper identification of occupational illnesses from exposure to hazardous chemicals is extremely important. Physicians might misdiagnose and improperly treat an injured miner, which could lead to a more serious or even fatal outcome.

DATA SOURCES

We used seven data sources to estimate the number of employee fatalities, injuries, and illnesses that could be prevented by full compliance with this final rule. These data sources are:

- (1) MSHA's Directorate of Program Evaluation and Information Resources, Office of Program Policy Evaluation [PEIR or 1];
- (2) the Bureau of Labor Statistics (BLS) 1998 annual report entitled Survey of Occupational Injuries and Illnesses in the United States by Industry [2];
- (3) the American Cancer Society's Cancer Facts and Figures - 1999 [3];
- (4) OSHA's Final Regulatory Impact Analysis (RIA) for its 1983 Hazard Communication Standard [4];
- (5) OSHA's Preliminary RIA for its 1988 Hazard Communication Standard [5];

¹⁹ U.S. Department of Labor, Bureau of Labor Statistics, "Occupational Injuries and Illnesses: Counts, Rates, and Characteristics, 1994," Bulletin 2485 (April 1997), p. 7.

(6) State and Metropolitan Area Data Book 1997-1998, Civilian Labor Force and Employment. U.S. Department of Commerce, Economics and Statistics Administration, 5th edition [6]; and

(7) Deaths from 282 Selected Causes by 5-Year Age Groups, Race, and Sex, Each State and the District of Columbia, 1995, 1996, and 1997 (National Center for Health Statistics) [7].

The characteristics of the BLS data [2] and the American Cancer Society data [3] are well-known and require no additional description.

Two sets of information from the OSHA RIAs [4 and 5] were particularly useful for deriving estimates of the benefits of this final HazCom rule: (1) OSHA's adjustments for the under-reporting of occupationally-related illnesses and (2) OSHA's estimates of the potential preventability of chemically-related accidents. OSHA developed these estimates after examining data from several different sources. Unfortunately, we are not aware of any follow-up studies evaluating the validity of these

estimates.²⁰ Therefore, in the absence of dissenting analyses, we adopted, where appropriate, these OSHA estimates.

By way of introduction to PEIR databases, coal mine operators were required by law in 1970 and M/NM mine operators were required by law in 1972 to investigate and to report to the Department of the Interior's Bureau of Mines each accident, fatality, injury, and illness occurring at a mine site. With the creation of MSHA in 1978, these reports were transferred to the MSHA Directorate of Technical Support's Denver Safety and Health Technology Center. MSHA has developed improved reporting methods that incorporate a narrative description of the incident. Each accident file also contains such background information as the mine identification number, accident location, and commodity mined, as well as information concerning the type of accident,

²⁰We contacted OSHA to identify whether that Agency had conducted any more recent studies of the effectiveness of its Hazard Communication Standard (HCS). The Agency reported that it had not performed any retrospective studies to validate the estimates in its earlier RIAs for the HCS. Furthermore, OSHA stated that it could not reasonably extract the data to perform such a retrospective study and that any such study would probably significantly underreport pre-HCS injuries and illnesses and post-HCS benefits because of the inability of workers (or employers), prior to OSHA's HCS, to draw a connection between workplace exposures to hazardous chemicals and subsequent health effects.

However, a General Accounting Office (GAO) report submitted to members of Congress, which summarized the experiences of some 2000 surveyed employers in complying with OSHA's HCS, provides clear evidence that OSHA's hazard communication requirements are effective in reducing injuries and illnesses. Seventeen percent (17%) of surveyed employers reported fewer work-related injuries, and 16% reported fewer work-related illnesses. Because of HCS, 29% of surveyed employers stated that they use less hazardous chemicals in the workplace. See U.S. General Accounting Office. Employers' Experiences in Complying with the Hazard Communication Standard. Washington, D.C., GAO/HRD-92-63BR, 1992.

nature of injury, part of body, degree of injury, source of injury, and miner activity at the time of the accident.

PEIR's fatality reports include nearly every traumatic miner fatality because such a fatality is a clearly defined event, and mine operators have reported nearly all of these fatalities to MSHA. Because each reported fatality generates an on-site investigation by MSHA personnel, the fatality data files provide a reasonably accurate report of both the number and the causes of traumatic miner fatalities. The significance of these fatality data files for this analysis is that they include all miner fatalities caused by an acute exposure to a hazardous chemical.

Similarly, PEIR's injury reports include most traumatic miner injuries. We believe that these data provide a reasonably accurate estimate of the number of miner injuries because the typical traumatic injury is generally a well-defined event. That is, there is generally little question as to whether an injury occurred, although there are situations (e.g., back injuries) in which one incident may lead to a series of repeated injuries and there may be some question as to whether each repeated injury needs to be reported to MSHA. Thus, to the extent that there may be significant under-reporting of acute injuries, it would generally occur because the mine operator did not report the injury, rather than because the mine operator was uncertain whether an injury occurred. Because we believe that mine

operators have been reporting most of these acute injuries, we expect that PEIR's data reports do not reflect substantial under-reporting of injuries.²¹

Unlike the number of reported fatalities and injuries due to traumatic accidents, however, we believe that PEIR's acute illness reports significantly underestimate the actual number of acute illnesses because, in many cases, the association between the workplace hazard and the acute illness is unknown to either the miner or the mine operator. A similar argument was advanced in OSHA's Hazard Communication RIA [4, p. II-27]:

Unfortunately, available data do not allow a precise appraisal of the number of occupational injuries and illnesses that might be described with exposure to chemicals. This imprecision can be attributed to two separate but related problems. First, ..., published data may understate all work-related illnesses by as much as a factor of 50. Second, because of a lack of hazard information in some workplaces ..., it seems likely that a disproportionate fraction of these unreported occupational illnesses may be from a chemical source.

Consistent with that argument, we believe that the actual number of acute illnesses exceeds the number reported in the PEIR database. A contributing factor to under-reporting of occupational illnesses is the lack of knowledge about health effects associated with chemical exposures. This information is important because miners are at an increased risk of harm in the absence of such knowledge. Nevertheless, we do not have an

²¹ We note, however, that in a 1978 MSHA mine audit program, now severely dated, the Agency determined that there was approximately 13 percent operator under-reporting of mine accidents and injuries to the Agency.

acceptable basis on which to adjust PEIR's data to account for this probable under-reporting of acute illnesses. Consequently, we conclude that the number of reported acute illnesses associated with exposures to hazardous chemicals is the lower-bound estimate of the actual number of these acute illnesses.

Finally, PEIR's data files for chronic illnesses similarly underestimate the actual number of chemically-related occupational chronic illnesses. Several commenters stated that a fair number of chemical accidents went unreported, due largely to the fact that the injured persons did not view the nature or extent of the injuries to be significant at the time the accidents occurred. Others feared the risk of loss of employment if they reported the accident. In order to reduce under-reporting, MSHA requires mine operators to report illness cases for which a miner has received workers' compensation. (However, if a miner retires and then collects workers' compensation, he/she is no longer considered a miner, and the mine operator does not have a responsibility to report the illness to us.) Notwithstanding this requirement, we believe that PEIR's data still greatly underestimate the number of chronic illnesses from occupational exposures to hazardous chemicals.²² Even so, these

²² Evidence of illness under-reporting, even under this requirement, was provided by an MSHA illness reporting amnesty program, which permitted mine operators, over a 4 ½ month period starting in October 1997, to report occupational illness cases—without risk of penalty—that had been unreported

lower-bound numbers are sufficiently disturbing as to warrant this HazCom rule.

As an alternative approach to estimate the number of chronic illnesses, we considered the use of exposure levels and quantitative risk assessments to estimate the number of miners who develop chronic illnesses from occupational exposures to hazardous chemicals. The ability of this alternative methodology to provide these estimates is limited by two factors. The first factor is that no data source exists that can identify all of the specific hazardous chemicals or can quantify the levels of each hazardous chemical to which each miner is or may be exposed. The second factor is that even when a hazardous chemical exposure level is known, quantitative risk assessments do not exist for most hazardous chemicals. The implication of these limitations is that the alternative methodology cannot provide direct estimates of either the numbers of long-term chronic occupational illnesses or the numbers of premature occupational fatalities that are the ultimate consequences of occupational exposures to certain hazardous chemicals.

As a result, we relied upon the OSHA methodology and have adopted many of OSHA's assumptions in order to estimate the

to MSHA over the previous five years. Two of the conditions for reporting an illness were that (1) a physician had diagnosed the illness as partly or completely occupational, and/or (2) the illness was found compensable under workers' compensation. Over 3,900 illnesses were reported during the 4 ½ month program.

number of chronic employee illnesses due to occupational exposures to hazardous chemicals.

POPULATION-AT-RISK

Based on final 2000 employment data, there are about 306,000 miners, including independent contractor workers, of whom about 99,000 work at coal mines and 207,000 work at M/NM mines.²³ In performing their duties and moving about the mine, these miners could be exposed to hazardous chemicals. As a result, these miners are potentially at risk of incurring a chemically-related occupational injury or illness.²⁴

Many miners are currently covered by one or more regulations, including other hazard communication standards, that partially overlap provisions of the final HazCom rule. Consequently, it is difficult to establish the number of miners in the population-at-risk who are affected only by this final HazCom rule. We estimate, however, that about 60 percent of the mining workforce (or 183,000 miners), including 75 percent of the employment at small operations (or 63,000 miners at operations

²³ See earlier Tables II-1 through II-4 in Chapter II of this REA.

²⁴ In addition, some miners inadvertently put their families at risk. For instance, a commenter stated that he used to shower at the mine before leaving to go home. However, after the mine began to use chemicals to treat the water system, his co-workers and he developed a skin rash whenever they showered there. Therefore, he had to go home in his work clothes. This commenter is afraid that his family will come in contact with the hazardous chemicals on his clothes.

with fewer than 20 employees), are not currently covered by a comprehensive hazard communication program.

Because many chemically-related accidents could have been prevented by compliance with one of several different provisions in this rule, it is impossible to establish a unique number of accidents and, thereby, a unique number of miners at risk associated with each provision. However, we do have a rough idea of the percentage of operators, by type and mine size, which are currently in compliance with the various provisions of the HazCom final rule. For example, we believe that current compliance with the HazCom provisions increases with increases in mine size, that current compliance rates for the access provisions of the HazCom final rule are relatively low, that current compliance rates for the labeling provisions of the HazCom final rule are relatively high, and that current compliance rates for the program, MSDS, and training provisions lie broadly in the middle. That information is based on the field experience and knowledge of MSHA's technical staff, as augmented by comments on and MSHA's subsequent review of compliance rate estimates in the proposed and interim final HazCom rules. We have used that information to develop specific estimates of current compliance rates by provision,²⁵ and we have applied those estimates in Chapter IV of

²⁵ See U.S. Department of Labor, Mine Safety and Health Administration, "Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

this REA to calculate the costs of complying with the HazCom final rule.

SUMMARY OF ACCIDENTS AND POTENTIAL BENEFITS

In Table III-1, we provide estimates of the annual numbers of chemically-related miner fatalities and acute injuries and illnesses. In Table III-2, we summarize our estimates of the likely numbers of these accidents preventable by compliance with this rule. In Table III-3, III-4, III-5, and III-6, we provide employment and cancer statistics in order to estimate the effects of this rule on the number of occupationally-related miner cancer deaths.

ACUTE HEALTH EFFECTS

Fatalities

During the 17-year period from 1983-1999, there were nine reported fatalities from acute exposure to hazardous chemicals. As shown in Table III-1, this figure amounts to an average of approximately one fatality every two years. One-third of these fatalities occurred at coal mines with the remaining two-thirds occurring at M/NM mines. Most of these fatalities involved fatal burns to the miner from mishandling chemicals.

Potential Benefits: Reduced Fatalities

We reviewed each of the nine fatalities that had occurred during the 17-year period analyzed to determine whether the fatality might reasonably have been prevented by prior knowledge of the chemical hazard. Based on this review, we conclude that had the appropriate information concerning the potential hazards been disseminated and had adequate training on safe work practices been provided under a hazard communication program, then four of the nine fatalities probably would not have occurred. Thus, this rule is expected to prevent approximately one fatality every four years. As discussed below, this estimate is in addition to the estimated cancer fatalities prevented by this final rule.

Description of Acute Injuries and Illnesses

The acute injuries and illnesses that miners incur as a consequence of an exposure to a hazardous chemical are classified as chemically-related acute injuries or chemically-related acute illnesses. Some examples of chemically-related acute injuries are chemical burns and injuries from chemical explosions. Some examples of chemically-related acute illnesses are decreased respiratory function, nausea, and poisoning.

Estimated Number of Acute Injuries and Illnesses

With respect to the number of chemically-related acute miner injuries and illnesses, we used PEIR data to calculate an annual average of chemically-related acute miner injuries and illnesses (as seen in Table III-1). These data, however, do not allow us to differentiate the total number into separate estimates for injuries and illnesses because the PEIR data system does not code them separately.

As an alternative method to provide individual estimates for injuries and for illnesses, we also reviewed BLS's general breakdown of acute occupational injuries or illnesses into separate estimates for injuries and for illnesses. We determined, however, that the BLS breakdown on the basis of all occupational injuries and illnesses is inappropriate for chemically-related occupational injuries and illnesses, primarily because the percentage of illnesses in all chemically-related accidents is likely to be substantially greater than the percentage of illnesses in all accidents. As a result, we did not separate the total number of acute injuries and illnesses into its two individual components: (1) acute injuries and (2) acute illnesses.

We determined that, during the 17-year period from 1983 to 1999, there was an average of 421 acute, chemically-related injuries and illnesses per year, 110 injuries and illnesses

(26 percent) occurring in coal mines and 311 (74 percent) occurring in M/NM mines. Of these, 257 (61 percent) were chemical burns and 48 (11 percent) were poisonings.

With respect to the number of lost workdays and days of restricted work activity due to chemically-related acute injuries and illnesses, PEIR's data report both the number of these acute injuries and illnesses that involved lost workdays and the number that did not involve lost workdays. An average of 239 chemically-related injuries and illnesses occur each year that are serious enough to involve lost workdays; 182 are not serious enough to require lost time. On average, 2,885 workdays are lost annually as a result of chemically-related occupational mining injuries and illnesses. Each lost workday injury or illness costs the affected miner, and the mine operator, approximately 12 workdays.

Table III-1: Annual Number of Chemically-Related Injuries and Illnesses by Type Of Employer

Type of Employer	Acute Injuries, Illnesses, and Fatalities					
	Fatalities	Total Injuries & Illnesses	Lost Workday Injuries & Illnesses	Non-Lost Workday Injuries & Illnesses	Number of Lost Workdays	Ave. # of Lost Workdays Per Injury or Illness
Coal Mine	0.165	110	74	36	986	13.3
M/NM Mine	0.335	311	165	146	1899	11.5
Total	0.5	421	239	182	2885	12

Source: Analysis by Mine Safety and Health Administration, Office of Standards, Regulations, and Variances of MSHA Miscellaneous Accident, Injury, and Illness Data and Information from 1978-1998 (closeout data); prepared by MSHA Office of Program Evaluation and Information Resources.

Potential Benefits: Reduced Injuries and Illnesses

There are two primary reasons why we did not review each chemically-related miner acute injury and illness individually to determine whether compliance with this final rule would have prevented such injury or illness.

The first reason is that significantly less information is available for a non-fatal injury or illness than for a fatality. Whereas MSHA's investigation of every fatality for a fatality report includes a mine visit by MSHA personnel, the description of an injury or illness is generally based only on the mine operator's report. Because the mine operator's injury and illness report is typically less complete than a fatality report done by MSHA personnel, determining the potential preventability of each injury or illness is more subjective and speculative than is the case for a fatality. The second reason is that the information garnered by OSHA during the public rulemaking on its rule is available for us to use.

OSHA estimated that its HCS rulemaking would reduce chemically-related acute injuries and illnesses by 20 percent (5, p. II-2 and 7, p. 53328). We have adopted OSHA's estimate of the effectiveness of its HCS, with modification as described below, as a basis for MSHA's estimate of the effectiveness of this final HazCom rule.

The need for modification is that, as previously stated, some mining operations have implemented one or more components of a hazard communication program into their standard operating procedures. A number of them are already in full compliance because they are under OSHA jurisdiction or state right-to-know laws. We previously estimated that about 40 percent of miners are covered by an existing hazard communication program. For this REA, we assume that those operators currently in compliance with the HazCom final rule are in full compliance; they will therefore obtain no additional miner injury or illness reduction as a result of the enactment of the HazCom final rule.²⁶

To measure the effectiveness of a hazard communication program, we have, throughout this rulemaking, used OSHA's estimate of a 20 percent injury and illness reduction rate. This rate would apply both to operators currently in compliance with the HazCom final rule and to the remaining operators who will come into compliance when the final rule takes effect. This means that, holding everything else constant, a miner at an operation currently in compliance with HazCom would have, on average, only 80 percent of the injuries and illnesses of a miner at an operation not currently in compliance with HazCom.

²⁶ In the REA for the interim final rule, we assumed that HazCom would have one-half of the 20-percent-reduction effect for those 40 percent of miners working at operations with an existing hazard communication program (and therefore already at least partially informed about chemical hazards). Under that assumption, HazCom would prevent 16 percent of current chemically-related injuries and illnesses.

Furthermore, as previously noted, HazCom will provide safety and health benefits only to those miners at operations not currently in compliance with HazCom. Based on these assumptions, the effectiveness of the HazCom final rule relative to observed miner injuries and illnesses can be estimated by the following formula:

$$IP = e * (I - (c * (1 - e) * I)) = (e - (e * (1 - e) * c)) * I,$$

where IP is the number of injuries and illnesses prevented annually by HazCom, e is the injury and illness reduction rate due to compliance with a hazard communication program, I is the current number of injuries and illnesses observed annually, c is the current compliance rate with HazCom, and (1-e) is the injury rate for operators currently in compliance with the HazCom final rule.

When e, the injury and illness reduction rate due to compliance with a hazard communication program, is equal to 0.2, as OSHA assumed, the formula reduces to the following:

$$IP = 0.2 * (I - (c * 0.8 * I)) = (.2 - (.16 * c)) * I,$$

We estimated that approximately 40 percent of the mining workforce is covered by a comprehensive hazard communication program. Setting "c" in the above formula equal to 0.4 yields a

value of IP, the number of injuries and illnesses prevented by HazCom, equal to 13.6 percent of the current number of injuries and illnesses observed annually. We previously indicated the difficulty of identifying the relative effectiveness of (compliance with) the individual provisions of the HazCom final rule in preventing injuries and illnesses from miner exposure to hazardous chemicals. What we have assumed is that compliance with each of the five types of HazCom provisions (program, labeling, MSDSs, training, and access) is equally effective, so we have used the composite compliance rate, of approximately 40 percent, to modify OSHA's estimate of the effectiveness of a hazard communication program in preventing injuries and illnesses from miner exposure to hazardous chemicals.

Because of the ad hoc assumptions underlying these estimates, we conducted a sensitivity analysis of OSHA's assumed 20 percent injury and illness reduction rate due to compliance with a hazard communication program.²⁷ We estimated the benefits of HazCom assuming 40 percent current compliance with HazCom provisions and a 15, 20, and 25 percent injury and illness

²⁷ A General Accounting Office (GAO) report submitted to members of Congress, previously mentioned in the chapter, provides some support for the use of a 20 percent injury and illness reduction rate to measure the effectiveness of a hazard communication program. The report, which summarized the experiences of some 2000 surveyed employers in complying with OSHA's HCS, noted that 17 percent of surveyed employers reported fewer work-related injuries, and 16% reported fewer work-related illnesses. Because of HCS, 29% of surveyed employers stated that they use less hazardous chemicals in the workplace. See U.S. General Accounting Office. Employers' Experiences in Complying with the Hazard Communication Standard. Washington, D.C., GAO/HRD-92-63BR, 1992.

reduction rate due to compliance with a hazard communication program. The corresponding effects on the number of injuries and illnesses prevented by HazCom are 9.9 percent, 13.6 percent, and 17.5 percent, respectively, of the current number of injuries and illnesses observed annually.

Assuming HazCom will prevent 13.6 percent of the current number of injuries and illnesses observed annually, we estimate that an annual average of 57 chemically-related miner acute injuries and illnesses will be prevented by compliance with this final rule. An average of 15 of these 57 will be prevented in coal mines while another 42 will be prevented in M/NM mines. Of the 57 prevented chemically-related acute injuries and illnesses, 32.5 will be lost workday injuries and illnesses involving 392 lost workdays, and 24.8 will be non-lost workday injuries and illnesses. These estimates are summarized in Table III-2.

Table III-2: Annual Number of Acute Chemically-Related Injuries and Illnesses Potentially Preventable by Compliance With This Rule

Type of Employer	Acute Injuries, Illnesses, and Fatalities				
	Fatalities	Total Injuries & Illnesses	Lost Workday Injuries & Illnesses	Non-Lost Workday Injuries & Illnesses	Number of Lost Workdays
Coal Mine	0.08	15.0	10.1	4.9	134.1
M/NM Mine	0.17	42.3	22.4	19.9	258.3
Total	0.25	57.3	32.5	24.8	392.4

Source: Analysis by Mine Safety and Health Administration, Office of Standards, Regulations, and Variances of MSHA Miscellaneous Accident, Injury, and Illness Data and Information from 1978-1998 (closeout data); prepared by MSHA Office of Program Evaluation and Information Resources.

CANCER

Description of Illnesses

The spectrum of diseases that can develop due to exposure to a cancer-causing agent include both cancer and non-cancer health effects. For example, lung cancer and pneumoconiosis can be caused by exposures to silica or beryllium; mesothelioma or asbestosis can be caused by exposure to asbestos; and leukemia or aplastic anemia can be caused by exposure to benzene. These chronic adverse effects can be caused by occupational exposures to hazardous chemicals. We are restricting our analysis below to the final rule's expected impact on the incidence of cancer.

Estimated Number of Cancers

Whereas data on cancer incidence (i.e., the number of new cancer cases per year) and cancer mortality (i.e., the number of cancer-related deaths per year) are quite reliable, the estimates of the percentage of these cancers that are caused by occupational exposure to hazardous substances are less precise. Thus, the baseline cancer mortality rates in mine workers are based on our best estimates of those cancers that are related to occupational exposure.

In general, cancer incidence and mortality rates are based on data compiled by the National Cancer Institute's (NCI's) Surveillance, Epidemiology, and End Results (SEER) Program. On

this basis, the American Cancer Society estimated that there were 1,221,800 cancer cases and 563,100 cancer deaths in 1997 [3, p.1].

We used information reported by the Office of Technology Assessment (OTA) to estimate the number of these cancer deaths that were due to occupational exposure to carcinogens.²⁸ OTA concluded that 5 percent of all cancer cases are occupationally-related [5, p. II-20]. Thus, we calculate that in 1997, 28,155 of the 563,100 cancer deaths in the United States were due to occupationally-related causes.

In order to estimate the number of occupationally-related cancer deaths of mine workers in 1997, we utilized data on the average number of mine workers (miners and contract employees) (MSHA, Program Evaluation and Information Resources, 1998 closeout data) and data from the Civilian Labor Force and Employment (U.S. Department of Commerce, 1998).

We first tabulated total mining employment and national employment figures for 1997. (See Table III-3.) We assumed that only mining production workers and contractor workers would be significantly exposed to carcinogens on the job. This category includes underground, surface, and mills and preparation plant employees and contractor workers for both coal and M/NM mining. We estimated that there were a total of 325,500 miners and

²⁸ U. S. Congress, Office of Technology Assessment, Preventing Illness and Injury in the Workplace, April 1985, page 5.

contractor employees. Of these, 206,500 were employed in M/NM mining and 119,000 were employed in coal mining.

Table III-3: Estimated Employment 1997

All Mining Employment ^a	Metal/Nonmetal Employment ^a	Coal Employment ^a	U.S. Employment ^b
325,500	206,500	119,000	129,558,000

^a Source: U.S. Department of Labor, Mine Safety and Health Administration, Program Evaluation and Information Resources. Estimates include miners and contractor employees.

^b Sources: "State and Metropolitan Area Data Book - 1997-1998, Civilian Labor Force and Employment." U.S. Department of Commerce, Economics and Statistics Administration, 5th edition, 1997 estimates.

We then used these numbers to estimate the proportion of mine workers in the employed civilian U.S. population for the year 1997. As shown in Table III-4, the estimated proportion of mine workers in the employed civilian population is 0.00251 (0.00159 in M/NM mining and 0.00092 in coal mining).

Table III-4: Estimated Proportion of Miners in the Adult Population in 1997

Category	Proportion
Metal/Nonmetal	0.00159
Coal	0.00092
All Miners	0.00251

We combined these employment estimates with the earlier occupationally-related cancer mortality figures in order to estimate the number of occupationally-related cancer deaths that would be experienced by miners working in 1997. As shown in Table III-5, we estimate that the total number of occupationally-related cancer deaths among mine workers in 1997 would be 71.8. Applying the same methodology to mining employment figures for 2000, Table III-5 shows our estimate of 66.5 occupationally-related cancer deaths among mine workers in 2000.

Table III-5: Number of 1997 Miner Cancer Deaths Attributed to Occupational Exposure

Mine	Cancer Deaths in <u>1997</u> due to Occupational Exposure ¹	Cancer Deaths in <u>2000</u> due to Occupational Exposure ¹
Metal/Nonmetal	44.9	45.0
Coal	25.9	21.5
Total	70.8	66.5

¹ Assumes 5% of all cancers are caused by occupational exposures.

The estimates in Table III-5 may actually underestimate the total number of occupationally-related cancer deaths among mine workers. The reason is that the underlying 5 percent figure for

the proportion of cancer deaths that are occupationally related is reflective of the general population, both workers and non-workers. Occupationally-related cancers in the population of mine workers, many of whom can be exposed to carcinogens in their workplace, is likely to be much higher than 5 percent. We believe that, overall, this estimate broadly illustrates the significant cancer risk for current mine workers but, as explained above, somewhat underestimates the actual risk.

For purposes of this analysis, we assume that the level of mining employment will remain constant over the next 20 years. We also assume a constant mortality rate from cancer in mine workers, although we note that cancer incidence and mortality have been increasing annually in the United States. We recognize that workers in mines are occupationally exposed to certain levels of carcinogens, even though the Agency is working to reduce harmful exposures. The number of cancer cases in these workers is expected to vary little in the short run due to the latency period of 10 to 40 years for cancer to develop following exposure. This implies that the number of occupationally-related cancer deaths in mine workers will probably not decline appreciably over the next 10 years, if not longer, as a result of this final HazCom rule.

Potential Cancer-Related Benefits

In order to determine the potential number of cancer deaths that will be prevented by compliance with hazard communication rules, we adopted, with modification, the methodology used by OSHA in its Hazard Communication RIA [5, pp. II-21 and II-22]. OSHA estimated that compliance with its rule will not affect the cancer incidence rates during the first 10 years after its promulgation. Starting in Year 11, however, a 2-percent annual reduction will occur and this percentage reduction will increase annually by an additional 2 percentage points in each succeeding year through Year 20, at which time the expected annual cancer reduction rate will be 20 percent. This 20 percent annual reduction rate will thereafter remain constant.

As previously noted, some mining operations have already implemented one or more components of a hazard communication program into their standard operating procedures. For that reason, we earlier reduced the effect of the HazCom rule in preventing injuries and illnesses from 20 percent to 13.6 percent. Similarly, we must modify OSHA's estimates of the effect on cancer incidence rates as follows. Due to the latency of cancer, starting in Year 11, the first annual reduction in occupationally-induced cancer deaths will occur (1.36 percent) and this percentage reduction will increase annually by an additional 1.36 percentage points in each succeeding year through

Year 20, at which time the expected annual cancer reduction rate will be 13.6 percent. This 13.6 percent annual reduction rate will thereafter remain constant.²⁹

To summarize, the logic underlying the increasing percentage reduction from Year 11 to Year 20 is as follows: (1) We assume there is a 10-20 year latency period between miner exposure to a chemical hazard and the manifestation of the consequent cancer. (2) We assume that latency is "linear" over that period (that is, each year from Year 11 to Year 20, cancer symptoms will appear and be diagnosed for ten percent of the cancers from exposures to chemical hazards in Year 1). (3) Because of the latency period, there will be no cancer reduction in Years 1-10 associated with the first year the HazCom rule is in effect; similarly, there will be no cancer reduction in Years 2-11 associated with Year 2 of the HazCom rule; and so on. (4) In Year 11, there will be a cancer reduction associated with Year 1 of the HazCom rule; in Year 12, there will be a cancer reduction associated with both Year 1 and Year 2 of the HazCom rule; and so on, until Year 20, when there will be a cancer reduction associated with each of the Years 1-10 of the HazCom rule. (5) In Year 20, the rule will

²⁹ Therefore, due to the HazCom rule, in Year 20 and each year thereafter, we estimate a 13.6 percent reduction in the number of occupationally-induced premature cancer deaths. Note that, in the interim final rule, we did not modify OSHA's estimates of the effect on cancer incidence rates, using a 20 percent reduction rather than a 13.6 percent reduction due to the HazCom rule. As a result, the estimates of prevented cancer deaths presented here are lower than those presented in the interim final rule.

have reached "steady-state," with cancer reductions from then on due to reduced exposure to chemical hazards over a ten year period, 10-20 years earlier.

The basis for our choosing a 1.36 percent reduction in Year 11 can be summarized as follows: (1) We adopted, with modification, OSHA's assumption that its Hazard Communication Standard (HCS) would prevent 20 percent of injuries and illnesses from exposure to chemical hazards. (2) The modification is due to the fact that approximately 40 percent of miners are employed by operators who have already implemented a hazard communication program. (3) We assumed that, for those miners already informed about chemical hazards, the HazCom final rule would not prevent additional injuries and illnesses from exposure to chemical hazards. (4) The net effect is a 13.6 percent reduction of current chemically-related injuries and illnesses due to HazCom. (5) As explained above, in Year 11, there will be a cancer reduction due to reduced exposures to chemical hazards in Year 1 of the HazCom rule; because of our assumption of "linear" latency effects between Years 11-20, 10 percent of the total cancer reduction due to reduced exposures to chemical hazards in Year 1 will occur in Year 11. (6) Therefore, 10 percent of the 13.6 percent reduction due to HazCom—or a 1.36 percent reduction—of injuries and illnesses from exposure to chemical hazards will occur in Year 11.

On that basis, we estimate that a total of 50 mine worker deaths from cancer will be prevented during the first 20 years of its rule (see Table III-6). This includes 34 prevented cancer deaths in M/NM mine workers as well as 16 prevented cancer deaths in coal mine workers. In addition, we estimate that this rule will prevent an average of approximately 9 (13.6 percent of 66.5) deaths each year after Year 20.

Table III-6: Annual Occupationally-Related Mine Worker Cancer Deaths and the Reduction in Mine Worker Deaths Due to Compliance with the MSHA Hazard Communication Rule in the First 20 Years and Each Year Thereafter

Mine	Estimated Annual Cancer Deaths ¹	Reduction in Miner Deaths, First 20 Year Period ²	Reduction in Miner Deaths, Each Year after Year 20 ²
Metal-Nonmetal	45.0	33.7	6.1
Coal	21.5	16.1	2.9
Total	66.5	49.8	9.0

¹ Based on OTA assumption that 5 percent of all cancers are occupationally-related. (U. S. Congress, Office of Technology Assessment, Preventing Illness and Injury in the Workplace, April 1985, page 5.)

² Assumes a 1.36%/year decrease in deaths after Year 10, leveling out at a constant yearly rate of a 13.6% reduction at Year 20.

CONCLUSION

Based on the above data and analysis, we conclude that miners face a significant risk from exposure to hazardous chemicals. We further conclude that compliance with this rule will prevent a substantial number of illnesses, fatalities, and cancer cases.

We have determined that, in terms of acute health effects, compliance with this rule will prevent one fatality every four years. In addition, compliance with this final rule will reduce chemically-related miner acute injuries and illnesses by an average of 57 cases per year, 15 in coal mines and 42 in M/NM mines. Of the 57 prevented chemically-related acute injuries and illnesses, 32.5 will be lost workday injuries and illnesses involving 392 lost workdays and 24.8 will be non-lost workday injuries and illnesses.

Finally, in terms of long-term health effects, we expect the final rule to prevent a total of 50 cancer deaths (16 in coal and 34 in M/NM) from Year 11 through Year 20 after promulgation and an additional 9 cancer deaths (3 in coal and 6 in M/NM) every year thereafter.

IV. COST OF COMPLIANCE

INTRODUCTION

In this chapter, we estimate the costs that operators will incur to comply with the provisions of the final HazCom standard. We have concluded that the final rule will cost about \$7.8 million yearly, \$5.5 million for the M/NM mining industry and \$2.3 million for the coal mining industry.

For the purpose of the cost analysis, we used our traditional definition of a small mine as one employing fewer than 20 miners. Based on 2000 data, the final rule will cover about 19,900 operators, including independent contractors. Of this total, about 16,500 (or 83 percent) employ fewer than 20 miners. The estimated total yearly cost of complying with the final rule will be \$4.3 million for small M/NM operators and \$1.4 million for small coal operators. Table IV-1 summarizes the estimated annual compliance costs of the final rule by mine size and by provision. For the mining industry as a whole, these estimates reflect first-year compliance costs of \$31.6 million and compliance costs of \$6.1 million the second year and each succeeding year.

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

Provision	Coal			M/NM			Total
	Small (< 20)	Large (20-500)	Large (> 500)	Small (< 20)	Large (20-500)	Large (> 500)	
HazCom Program	\$465,293	\$260,734	\$1,088	\$1,288,695	\$301,261	\$2,980	\$2,320,051
Labels	\$31,699	\$49,813	\$2,043	\$75,845	\$64,844	\$7,089	\$231,332
MSDSs	\$290,618	\$85,463	\$105	\$496,264	\$81,726	\$475	\$954,650
HazCom Training	\$452,382	\$315,388	\$3,649	\$1,204,195	\$416,068	\$8,032	\$2,399,714
Access	\$196,116	\$125,650	\$1,845	\$1,238,494	\$289,512	\$3,170	\$1,854,788
Total	\$1,436,107	\$837,048	\$8,730	\$4,303,493	\$1,153,412	\$21,745	\$7,760,535

*Source: Tables IV-10, IV-11, IV-17, IV-25, and IV-28.

All cost estimates in this chapter are presented in 2001 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.

METHODOLOGY

For this final rule, we 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 recur. For example, the cost to develop a written procedural program occurs only once. For the purpose of this REA, one-time

costs have been amortized using an (real) annual discount rate of 7 percent, as required by the U.S. Office of Management and Budget (OMB), over an infinite (or, at least, indefinite) period using the formula:

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

where "a" is the annualization factor, "i" is the annual discount rate, and "n" is the economic life of the investment. As "n" becomes large, the value of "a" approaches the discount rate. Therefore, for one-time investments with an infinite life, we have applied an annualization factor equal to the discount rate of 7 percent. This means that the annualized cost is equal to 7 percent of the one-time cost.

Converting one-time costs to annualized costs allows us to add them to annual costs in order to compute a combined yearly cost for the rule. Annual costs are those that normally recur annually. Three examples of annual costs are maintenance costs, operating expenses, and recordkeeping costs.

Our method of handling some types of "annual" costs requires explanation. In a few instances, the final rule imposes costs which will be the same each year starting with the second year the rule is in effect, but whose first year costs are different (and larger). We separated these first year costs into two parts: (1) an amount equal to annual costs starting with Year 2 after the rule takes effect, and (2) the residual, which we term

"adjusted" first year costs.³⁰ The adjusted first year costs could then be annualized and added to annual costs (all beginning in the first year the rule takes effect) in order to arrive at yearly costs. As a result, yearly costs begin in the first year that the rule takes effect and are the same every year thereafter.

Wages. Table IV-2 displays the compensation rates for various mine occupations. These compensation rates include benefits such as social security, unemployment insurance, and workers' compensation, but they do not reflect shift differentials or overtime pay. For convenience, we will refer to "compensation" in this REA as "wages," where that term is understood to include benefits. We assume that contractor workers receive the same wage as their fellow coal miners or M/NM miners.

³⁰ A hypothetical example might help to explain this procedure. Suppose that compliance costs are \$2,000 the first year and \$400 each year thereafter. The adjustment procedure simply splits first year compliance costs into two parts: (1) \$400, for the first year of annual costs; and (2) the residual \$1,600. Consequently, adjusted first year costs would be \$1,600 and annual costs (starting in Year 1) would be \$400.

TABLE IV-2: Average Hourly Compensation Rates in the Mining Industry, 2001*

Occupation	Coal	M/NM
Supervisor, Manager, Foreman, Professional	\$54.92	\$44.93
Miners, Equipment Operators, Skilled Trades	\$28.07	\$19.81
Clerical, Support Personnel	\$19.58	\$18.44

*Data derived from U.S. Coal Mine Salaries, Wages, and Benefits: 2001 Survey Results

New Mines. We have assumed that new and existing operations not currently in compliance with any of the provisions of the HazCom final rule will have the same compliance costs.³¹ This, we believe, is a reasonable assumption, and has not been challenged in comments at any stage of the rulemaking process. Nor, is the direction of bias clear to us, assuming our assumption to be wrong. On the one hand, existing operations may have lower costs in the form of physical and human capital in place to implement the HazCom provisions. On the other hand, new operations will have the HazCom rule in place and can select staff and products consistent with HazCom requirements. Furthermore, new operations will probably have fewer hazardous

³¹ Actually we estimate that the cost of the HazCom final rule per new operation is substantially higher than the cost per existing operation. The reason is that we assume that no new operations are currently in compliance with any of the provisions of the HazCom final rule while, as explained later in this section, we estimate that existing operations have a composite average compliance rate for all provisions of 43.64 percent, weighted by the number of miners, and 30.26 percent, weighted by the number of mines.

chemicals onsite than an existing operation, which might (perhaps inadvertently) have acquired and accumulated various hazardous chemicals over time.

Comments on Costs. Commenters on the interim final rule argued that MSHA had overestimated the percentage of mine operators, particularly larger operators and contractors, which are currently in compliance with OSHA's HCS and would already be in substantial compliance with MSHA's HazCom rule. In addition, commenters on the interim final rule argued that MSHA had failed to include costs for obtaining and assembling MSDSs and had underestimated the time required to comply with a variety of provisions of MSHA's HazCom rule.

Based on our own technical review and in response to these comments, we have introduced three major sets of changes in this REA for the final HazCom rule. First, we re-examined and subsequently modified our estimates of compliance rates for all operator types for all ten mine size classifications.³² The most important changes were (a) that we no longer assumed that all operators with more than 500 employees would be in substantial compliance with the final rule,³³ and (b) that we dramatically

³² See U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. "Compliance and Non-Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

³³ Our estimates of non-compliance rates went from 0 percent in the interim final rule for all provisions, for all operators with more than 500 employees, to the following:

increased our estimates of the number of contractors not currently in compliance with the various provisions of the final rule.³⁴ Second, we added costs to reflect the effort that operators must expend to obtain and assemble MSDSs, or alternatively, under the option provided in the final rule, the effort required by an operator to establish access to MSDSs from an internet or commercial site. Third, in several instances, we increased our estimates of the time required for mine operators in specific size categories to comply with particular provisions of the final rule. These include time estimates for mine operators with more than 500 employees for all provisions of the final rule (except the time estimates in Table IV-8, which were unchanged from the estimates for the interim final rule) and time estimates for mine operators in other size categories to develop MSDSs and to prepare lesson materials for HazCom training.

In addition, because the final rule does not provide a full

<u>Mine Type</u>	<u>HazCom Program</u>	<u>Labels</u>	<u>MSDSs</u>	<u>Training</u>	<u>Access</u>
Coal Mine	10%	5%	5%	30%	75%
M/NM Mine	10%	5%	5%	5%	5%
Coal Contractor	50%	50%	50%	50%	100%
M/NM Contractor	50%	50%	50%	50%	100%

See U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. "Compliance and Non-Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

³⁴ Our estimates of contractor non-compliance rates increased by at least 44 percentage points for all mine size categories and all provisions relative to those in the interim final rule. See U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. "Compliance and Non-Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

year between publication of the final rule and its effective date, most operators will not be able to incorporate HazCom training into their existing part 46 or part 48 training cycle. As a result, we have had to add to the cost of the final rule the first-year cost for miners to receive initial HazCom training.³⁵

The effect of these aforementioned changes has been to increase MSHA's total compliance cost estimates from about \$5.7 million yearly for the interim final rule to about \$7.8 million yearly for this final rule—or, equivalently, from about \$270 per operator to about \$390 per operator.

Commenters on the interim final rule also expressed their belief that we had underestimated the cost for operators to label containers and that the wage rates for conducting hazard evaluations should be two to three times higher than we estimated because consultants, not mine employees, would be conducting the evaluation. More generally, several commenters argued, based on their experience or on the experiences of mine operators they represent, that compliance with HazCom requirements will cost many times more than MSHA has estimated.

³⁵ In the interim final rule, we delayed the effective date of the rule for one year, which would have allowed operators to incorporate HazCom training into their existing part 46 and part 48 training cycle. Therefore, in the REA for the interim final rule, the cost for miners to receive initial HazCom training was attributed to (and already included in) the costs of the existing part 46 and part 48 rules.

Nevertheless, we believe that the cost estimates in this REA represent a reasonable approximation of the burden on operators for the following reasons.

First, we have existing standards for labeling for M/NM mines and surface coal mines. We calculated only a small cost for labels because most hazardous chemicals are already labeled by the manufacturer or supplier before they are brought to the mine, and the HazCom rule exempts the raw materials being mined or milled from labeling. The small cost is for labeling storage tanks of bulk hazardous materials and portable transport containers, as necessary; labeling containers of hazardous chemical mixtures produced and used at the mine; labeling containers in underground coal mines; and replacing damaged or missing labels.

Second, 39 states have employee right-to-know laws (although in 34 of these states, the right-to-know laws apply only to OSHA-regulated industries). OSHA's HCS has had widespread impact on state right-to-know regulations and, indirectly, on the mining industry. All operators comply with some of the provisions of this final rule. Some independent contractors work in industries under OSHA jurisdiction, as well as in the mining industry, and some large companies have other businesses in industries under OSHA jurisdiction. These operators comply with some or most of the provisions of this final rule because of existing federal,

state, or local regulations. A few operators comply because the state regulations also cover mining. Others comply voluntarily because of corporate policy.

Third, we are developing compliance aids to reduce the burden on operators, especially small operators. These include generic HazCom programs. Because of our commitment to help the mining industry, especially small operators, implement a HazCom program with minimum burden, we do not anticipate a need for them to hire consultants.

Finally, there are four points we wish to make concerning the commenters' assertions that the cost of complying with MSHA's HazCom rule will be many times higher than we have estimated.

First, most of these commenters are employed by or represent large mining companies. Most of these larger mining companies employ hundreds and, in some cases, thousands of workers, while the average-sized operator covered by this rule employs 15 workers and the median-sized operator covered by this rule employs fewer than 10 workers. We believe the commenters were basing their assertions on the cost experiences of mines which are likely to have at least ten times the employment of the typical mine covered by this final rule. In addition, the mining processes for the commenters' large operations are likely to be much more complex, and involve many more chemicals, than those of the much smaller average-sized mine. Therefore, we would expect the compliance

costs that the commenters were reporting to be substantially higher than our estimated average compliance cost for all mining operations.³⁶

Second, the mines whose cost experiences were being reported were without benefit of the more flexible HazCom final rule, which permits, among other things, use of relevant training conducted in compliance with other MSHA, federal, or state regulations to meet comparable training requirements; labeling options for portable temporary containers; alternative sources of MSDSs; and storage of MSDSs at locations other than at the work site and in an electronic form.

Third, the mines whose cost experiences were being reported were without benefit of the HazCom compliance aids that are being developed by MSHA, and therefore their cost estimates would not reflect the associated cost savings.

Fourth, at least some part of the alleged cost disparity has been removed insofar as our estimate of compliance costs for the final rule has increased by almost 40 percent relative to those for the interim final rule.

Compliance Rates: Sensitivity Analysis. The costs of the HazCom final rule are a negative function of the number of

³⁶ Stated differently, while the compliance costs that the commenters were reporting are substantially higher than MSHA's estimated average compliance cost for all mining operations, these reported costs are generally not inconsistent with MSHA's estimated costs, given the size and complexity of the operations in question.

operators currently in compliance with the provisions of the HazCom final rule. Unfortunately, MSHA does not possess data on the current rate of operator compliance with the provisions of the HazCom rule. Instead, our estimates of operator compliance with the provisions of the HazCom final rule, by provision, by type of operation, and by size of operation, are the result of MSHA knowledge and experience augmented by public comment. The composite average current compliance rate for all provisions (giving equal weight to the five types of HazCom provisions: program, labeling, MSDSs, training, and access) is 43.64 percent, weighted by the number of miners, and 30.26 percent, weighted by the number of mines.³⁷ (The corresponding noncompliance rate, of course, is 100 percent minus the compliance percentage.)

Because we do not have concrete data supporting our estimates of current operator compliance with HazCom provisions, we performed a sensitivity analysis on the estimated compliance rates by performing two simulations. In one simulation, we raised the original compliance rate estimates for each provision by ten percentage points, and in the second simulation, we lowered the original compliance rate estimates for each provision by ten percentage points. In the first simulation, we restricted

³⁷ See U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. "Compliance and Non-Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

compliance rates not to exceed 100 percent, and in the second simulation, we restricted compliance rates not to go below 0 percent.

In the original case, the composite average non-compliance rate was 56.36 percent when weighted by the number of miners, and the total yearly cost of the rule was \$7.8 million. In the first simulation, the composite average non-compliance rate was reduced to 46.70 percent when weighted by the number of miners, and the associated total yearly cost was reduced to \$6.9 million. This 17.1 percent reduction in the non-compliance rate yielded an 11.4 percent reduction in total yearly costs. In the second simulation, the composite average non-compliance rate was increase to 64.84 percent when weighted by the number of miners, and the associated total yearly cost was increased to \$8.4 million. This 15 percent increase in the non-compliance rate yielded a 8.2 percent increase in total yearly costs.

Note that the effect of decreasing the non-compliance rate is constrained because, for many of the provisions, the larger mines are already (in the original estimates) at or near 100 percent compliance. For that reason, the cost of the rule with lower non-compliance is borne more by smaller mines (75.2 percent of total costs borne by mines with fewer than 20 employees in the first simulation versus 74.0 percent in the original estimates). The effect of increasing the non-compliance rate is also constrained

because, for many of the provisions, the smaller mines (and some of the larger mines) are already (in the original estimates) at or near 100 percent non-compliance. For that reason, the cost of the rule with higher non-compliance is borne more by larger mines (27.7 percent of total costs borne by mines with 20 or more employees versus 26.0 percent in the original estimates).

SCOPE

This final rule will apply to all coal and M/NM mines, including independent contractors. Table IV-3 presents the number of coal and M/NM mines and miners, excluding independent contractors and office workers, for both large and small mines. Table IV-4 presents the number of independent contractors and contractor workers by mine type and size.

TABLE IV-3: Distribution of Mines and Employment by Mine Type and Size

Mine Size (# miners)	Coal			M/NM		
	# Mines	# Miners	Miners per Mine	# Mines	# Miners	Miners per Mine
Small (< 20)	1,103	7,777	7.1	9,733	50,849	5.2
Medium (20-500)	791	57,271	72.4	1,746	90,598	51.9
Large (> 500)	6	3,312	552.0	23	19,056	828.5
Total	1,900	68,360	36.0	11,502	160,503	14.0

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances based on 2000 PEIR data. Office workers are not included in these employment figures.

**TABLE IV-4: Distribution of Independent Contractors and Employment
by Mine Type and Size**

Operation Size (# miners)	Coal			M/NM		
	# Operators	# Miners	Miners per Operation	# Operators	# Miners	Miners per Operation
Small (< 20)	2,486	10,626	4.3	3,147	15,352	4.9
Large (20-500)	349	17,927	51.4	492	27,214	55.3
Large (> 500)	2	1,025	512.5	5	3,659	731.8
Total	2,837	29,578	10.4	3,644	46,225	12.7

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances based on 2000 PEIR data. Office workers are not included in these employment figures.

Table IV-5 indicates the number of coal and M/NM mines and miners by state, excluding independent contractors and contractor workers, in the five states with employee right-to-know laws that cover mines. Table IV-6 indicates those 45 states and two territories without employee right-to-know laws that cover mines. These tables show the impact of state right-to-know regulations.

TABLE IV-5: Mines and Miners in States WITH Right-To-Know Laws Affecting Mines*

STATES	COAL				METAL AND NONMETAL			
	Mines		Miners		Mines		Miners	
	#	%	#	%	#	%	#	%
Alaska	1	0.04%	109	0.12%	69	0.60%	1,091	0.65%
California	2	0.08%	39	0.04%	555	4.87%	9,296	5.52%
Delaware					8	0.07%	102	0.06%
Maine					126	1.10%	535	0.32%
Rhode Island					23	0.20%	118	0.07%
Total WITH laws	3	0.12%	148	0.17%	781	6.85%	11,142	6.61%
Total mines&miners	2,491		89,054		11,407		168,530	

*Source: Mine Injury and Worktime Quarterly (1997 Closeout Edition) pp.7-17.

TABLE IV-6: Mines and Miners in States and Territories WITHOUT Right-To-Know Laws Affecting Mines

STATES	COAL				METAL AND NONMETAL			
	# Mines	% Mines	# Miners	% Miners	# Mines	% Mines	# Miners	% Miners
Alabama	70	2.81%	5,083	5.71%	176	1.54%	3,010	1.79%
Arizona	3	0.12%	720	0.81%	353	3.09%	11,580	6.87%
Arkansas*	7	0.28%	10	0.01%	167	1.46%	2,679	1.59%
Colorado	21	0.84%	1,689	1.90%	343	3.01%	3,159	1.87%
Florida					225	1.97%	6,499	3.86%
Connecticut*					93	0.82%	742	0.44%
Georgia*					238	2.09%	6,804	4.04%
Hawaii					34	0.30%	349	0.21%
Idaho					183	1.60%	2,663	1.58%
Illinois**	47	1.89%	4,620	5.19%	315	2.76%	3,766	2.23%
Indiana*	55	2.21%	2,942	3.30%	273	2.39%	3,021	1.79%
Iowa					254	2.23%	2,315	1.37%
Kansas*	2	0.08%	72	0.08%	178	1.56%	1,990	1.18%
Kentucky*	670	26.90%	19,867	22.31%	136	1.19%	2,901	1.72%
Louisiana	2		148	0.17%	152	1.33%	2,228	1.32%
Maryland	19	0.76%	495	0.56%	72	0.63%	1,553	0.92%
Massachusetts					146	1.28%	1,057	0.63%
Michigan					444	3.89%	4,861	2.88%
Minnesota					394	3.45%	7,193	4.27%
Mississippi					123	1.08%	1,231	0.73%
Missouri	5	0.20%	137	0.15%	357	3.13%	5,946	3.53%
Montana	7	0.28%	858	0.96%	219	1.92%	2,473	1.47%
Nebraska					181	1.59%	933	0.55%
Nevada					238	2.09%	11,638	6.91%
New Hampshire					95	0.83%	367	0.22%
New Jersey					87	0.76%	1,367	0.81%
New Mexico	7	0.28%	1,493	1.68%	203	1.78%	4,650	2.76%
New York					602	5.28%	4,172	2.48%
North Carolina**					270	2.37%	4,015	2.38%
North Dakota	6	0.24%	910	1.02%	106	0.93%	336	0.20%
Ohio*	122	4.90%	3,517	3.95%	360	3.16%	4,493	2.67%
Oklahoma	9	0.36%	246	0.28%	174	1.53%	2,037	1.21%
Oregon					248	2.17%	1,871	1.11%
Pennsylvania	546	21.92%	10,031	11.26%	384	3.37%	5,996	3.56%
Puerto Rico					117	1.03%	1,820	1.08%
South Carolina					126	1.10%	1,878	1.11%
South Dakota					130	1.14%	1,851	1.10%
Tennessee***	39	1.57%	737	0.83%	234	2.05%	3,798	2.25%
Texas*	15	0.60%	2,447	2.75%	609	5.34%	9,691	5.75%
Utah*	24	0.96%	1,955	2.20%	236	2.07%	3,693	2.19%
Vermont					166	1.46%	965	0.57%
Virgin Islands					4	0.04%	169	0.10%
Virginia	252	10.12%	7,058	7.93%	173	1.52%	3,519	2.09%
Washington	2	0.08%	547	0.61%	314	2.75%	2,440	1.45%
West Virginia*	532	21.36%	19,259	21.63%	57	0.50%	989	0.59%
Wisconsin					520	4.56%	2,582	1.53%
Wyoming	26	1.04%	4,065	4.56%	117	1.03%	4,098	2.43%
Total WITHOUT laws	2,488	99.80%	88,906	99.83%	10,626	93.15%	157,388	93.39%
Total mines & miners	2491		89,054		11,407		168,530	

Source: Mine Injuries and Worktime Quarterly, Closeout 1997, pp.7-17.

* Covers city, county, state owned & operated -- only public sector employees.

** Only requires MSDSs, list of substances, and notify fire department

*** Has Mining Division that urges compliance. MSHA HazCom will have negligible impact.

Some operators already comply with most or all of the provisions of this final rule and many comply with some of the provisions. Few operators, if any, comply with none of HazCom's provisions because existing regulations require them to train miners about the health and safety hazards of their tasks. Consequently, for the purpose of this analysis, we used separate estimates for compliance with each provision of this final rule.³⁸

³⁸ These estimates, for each provision, are a composite of separate estimates for coal mines, coal contractors, M/NM mines, and M/NM contractors in each of 10 size categories. Our estimates are based on our knowledge of and experience with the mining industry, on information about the impact of existing federal and state hazard communication standards on this industry, and on comments on the interim final rule. See U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. "Compliance and Non-Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors," December 12, 2001.

SECTION-BY-SECTION DISCUSSION

Below we estimate the costs of the final rule section by section. If a single cost element is related to a set of provisions, we assign that cost to a single provision and so note when the other provisions in the set are discussed.

The cost of human and material resources needed to comply with the various sections of the HazCom final rule, for each mine type and size category, were estimated by technical staff from MSHA's Offices of Standards, Regulations, and Variances; Educational Policy and Development; and Coal and Metal/Non-Metal Mine Safety and Health. These staff have considerable rulemaking and field experience and knowledge in estimating the resources required to comply with program development, training, and reporting requirements of provisions similar to those in the HazCom final rule.

§ 47.1 Purpose of a HazCom standard.

This section is informational in nature, and we do not associate any costs with it.

§ 47.2 Operators and chemicals covered.

This section is informational in nature. We include the compliance costs associated with this section in the cost estimates for the substantive provisions of the final rule.

§ 47.11 Definitions of terms used in this part.

This section defines some specific terms used in the final rule. These terms clarify the requirements of the final rule. The compliance costs associated with these definitions are included in the cost estimates for the substantive provisions where the terms are used.

§ 47.21 Identifying hazardous chemicals.

This section requires operators to determine if chemicals found on their mine property are hazardous. This section also requires operators to identify a hazardous chemical's potential to harm a miner's health or safety. We have included the cost for conducting the chemical inventory on the mine property and for identifying the chemical hazards as part of the compliance costs of the written HazCom program (§ 47.31).

§ 47.31 Requirement for a HazCom program.

This section requires operators to develop, implement, update, and maintain a comprehensive written HazCom program. The written program must describe how the operator will meet the requirements of the HazCom rule; list the hazardous chemicals known to be present at the mine; describe the procedures used to determine the chemicals' hazards; and describe how the operator will advise other operators at a mine site about the presence of chemical hazards. We have estimated separate costs for this section of the final rule for—

- (1) mines currently without a comprehensive, written HazCom program;
- (2) mines that have already implemented one or more components of a HazCom program in response to existing federal or state regulations or company policy;³⁹ and
- (3) new mining operations.

Mines without a HazCom program. We estimate that, for mines currently without a HazCom program, it will take an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's

³⁹ In the REA for the interim final rule, we provided separate estimates of the number of mines that have already voluntarily adopted a HazCom program, and we assumed that half of these mines would be in compliance with the provisions of the interim final rule. In this REA for the final rule, we have removed the separate calculation for mines with or without a voluntary HazCom program. The percentage estimate of mines currently in compliance with a provision includes those with a voluntary HazCom program. Conversely, some mines with a voluntary HazCom program may not currently be in compliance with particular provisions of the final HazCom rule. The percentage of mines not in compliance with a particular provision includes these latter mines.

time to develop such a program for small operations, an average of 16 hours of a supervisor's time and 8 hours of a clerical worker's time for operations with 20-500 employees, and an average of 32 hours of a supervisor's time and 16 hours of a clerical worker's time for operations with more than 500 employees. In addition, the material cost of developing a HazCom program will be about \$2.40 per small operation, \$4 per operation with 20-500 employees, and \$8 per operation with more than 500 employees.

We estimate that it will take an average of 1 hour of a supervisor's time and 0.5 hours (30 minutes) of a clerical worker's time to update the written program each year for a small operation, 2 hours of a supervisor's time and 1 hour of a clerical worker's time for an operation with 20-500 employees, and 4 hours of a supervisor's time and 2 hours of a clerical worker's time for an operation with more than 500 employees. We also estimate that material costs for updating the written program will be about half that for developing the program: \$1.20 per small operation, \$2 per operation with 20-500 employees, and \$3.20 per operation with more than 500 employees.

Table IV-7 provides our estimate of the cost to develop a written HazCom program. First-year costs were adjusted using the procedure described in the methodology section earlier in this chapter and converted to annual costs using an annualization factor of 7 percent.

TABLE IV-7: Cost of § 47.31 for Operations Without a Written HazCom Program

Operation Size (No. of miners)	No. of Operators Without a Written HazCom Program ^a	First Year Cost/Mine ^b	Total First Year Cost	Annually Recurring Cost per Operator ^c	Annual Recurring Cost	Adjusted First Year Cost ^d	Adjusted First Year Cost Annualized ^e	Total Yearly Cost ^f
Coal								
Small (< 20)	3,546	\$520	\$1,844,213	\$66	\$233,718	\$1,610,495	\$112,735	\$346,453
Large (20-500)	904	\$1,039	\$939,697	\$131	\$118,818	\$820,879	\$57,462	\$176,280
Large (> 500)	2	\$2,079	\$3,326	\$262	\$419	\$2,907	\$203	\$623
Total	4,452		\$2,787,236		\$352,956	\$2,434,281	\$170,400	\$523,355
M/NM								
Small (< 20)	12,650	\$436	\$5,510,389	\$55	\$700,184	\$4,810,205	\$336,714	\$1,036,898
Large (20-500)	1,628	\$870	\$1,416,691	\$110	\$179,528	\$1,237,163	\$86,601	\$266,129
Large (> 500)	5	\$1,741	\$8,356	\$220	\$1,055	\$7,301	\$511	\$1,566
Total	14,283		\$6,935,436		\$880,767	\$6,054,669	\$423,827	\$1,304,593

^a No. of operators without a written HazCom program = $[(M \times P_m) + (i \times P_c)]$, where M is the total number of mines in that size category (from Table IV-3); P_m is the percentage of mines without a written HazCom program [98.5% of small coal, 76.8% of large (20-500) coal, 10% of large (>500) coal mines; 98.1% of small M/NM, 69.0% of large (20-500) M/NM, 10% of large (>500) N/NM mines]; i is the number of independent contractors in that size category (from Table IV-4); and P_c is the percentage of independent contractors without a written HazCom program [98.9% of small coal, 85.1% of large (20-500) coal, 50% of large coal (>500); and 98.5% of small M/NM, 85.8% of large (20-500) M/NM, 50% of large (>500) M/NM] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b First-year cost to develop program = $[(W_s \times H_s) + (W_c \times H_c) + C]$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations; \$44.93 at M/NM operations); H_s is the number of hours for supervisor to develop HazCom program (8 hr/small operation, 16 hr/large (20-500) operation, and 32 hr/large (>500) operation); W_c is the hourly wage rate for clerical worker (\$19.58 at coal operations and \$18.44 at M/NM operations); H_c is the number of hours for clerical worker to prepare written program [4 hr/small operation, 8 hr/large (20-500) operation, and 16 hr/large (>500) operation]; and C is the cost of materials [\$2.40/small operation, \$4/large (20-500) operation, and \$8/large (>500) operation].

^c Annually recurring cost per operator = $[(W_s \times H_s) + (W_c \times H_c) + C]$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations; and \$44.93 at M/NM operations); H_s is the number of hours for supervisor to update HazCom program [1 hr/small operation, 2 hr/large (20-500) operation, and 4hr/large (>500) operation]; W_c is the hourly wage rate for clerical worker (\$19.58 at coal operations and \$18.44 at M/NM operations); H_c is the number of hours for clerical worker to update written program [0.5 hr/small operation, 1 hr/large (20-500) operation, and 2 hr/large (>500) operation]; and C is the cost of materials to update program [\$1.20/small operation, \$2/large (20-500) operation, and \$3.20/ large (>500) operation].

^d Adjusted first year cost = total first year costs - annual recurring cost.

^e Adjusted first year cost annualized = adjusted first year cost X 0.07, where 0.07 is the annualization factor.

^f Total yearly cost = annual recurring cost + adjusted first year cost annualized.

Mines with a HazCom program. Although some mining operations currently have a HazCom program to comply with existing federal or state regulations, these programs vary in their degree of compliance with this final rule. We have included a first-year cost for operators to review and modify their existing HazCom programs, as necessary, to bring them into compliance. However, for operations currently with a HazCom program, we did not include an annual cost for updating the written program after the first year because these operations were presumably already updating their written program each year.

We estimate that it will take an average of 4 hours of a supervisor's time and 2 hours of a clerical worker's time to evaluate and modify, as necessary, an existing written HazCom program for small operations; an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's time for operations with 20-500 workers; and an average of 16 hours of a supervisor's time and 8 hours of a clerical worker's time for operations with more than 500 workers. In addition, the material cost will be about \$1.20 per small operation, \$2 per operation with 20-500 workers, and \$4 per operation with more than 500 workers.

Table IV-8 provides our estimate of the cost of evaluating and updating an existing written HazCom program. This one-time,

first-year cost has been converted to annualized costs using an annualization factor of 7 percent.

TABLE IV-8: Cost to Review Existing Program for Operations With a HazCom Program

Operation Size (no. of miners)	No. of Operators With a HazCom Program ^a	First Year Cost per Operator ^b	Total First Year Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	43	\$260	\$11,177	\$782
Large (20-500)	236	\$520	\$122,586	\$8,581
Large (> 500)	6	\$1,039	\$6,652	\$466
Total	285		\$140,416	\$9,829
M/NM				
Small (< 20)	230	\$218	\$50,070	\$3,505
Large (20-500)	610	\$435	\$265,632	\$18,594
Large (> 500)	23	\$870	\$20,193	\$1,414
Total	863		\$335,895	\$23,513

^a No. of operators with a HazCom program = $(M \times P_m) + (i \times P_i)$, where M is the total number of mines (from Table IV-3); P_m is the percentage with HazCom program [1.5% of small, 23.2% of large (20-500), 90% of large (>500) coal mines; and 1.9% of small, 31% of large (20-500), 90% of large (>500) M/NM mines]; i is the number of independent contractors (from Table IV-4); and P_i is the percentage of independent contractors with HazCom program [1.1% of small coal, 14.9% of large (20-500) coal, 50% of large (>500) coal; and 1.5% of small M/NM, 14.2% of large (20-500) M/NM, 50% of large (>500) M/NM] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b First-year cost to review and modify program = $[(W_s \times H_s) + (W_c \times H_c) + C]$, where W_s = hourly wage rate for supervisor (\$54.92 at coal and \$44.93 at M/NM); H_s is the number of hours for supervisor to modify program [4 hr/small, 8 hr/large (20-500), and 16 hr/large (>500)]; W_c is the hourly wage rate for clerical worker (\$19.58 at coal, \$18.44 at M/NM); H_c is the number of hours for clerical worker to modify program [2 hr/small, 4 hr/large (20-500), and 8 hr/large (> 500)]; and C is the cost of materials [\$1.20/small, \$2/large (20-500), and \$4/large (>500)].

^c Annualized first-year cost = 0.07 X first-year cost (one-time).

New operations. We estimate that 227 small coal operations, 73 coal operations with 20-500 employees, 570 small M/NM

operations, and 19 M/NM operations with 20-500 employees open each year.⁴⁰ We estimate that it will take an average of 8 hours of a supervisor's time for small new operations and 16 hours for new operations with 20-500 employees to develop a HazCom program. We estimate that developing a HazCom program will also take an average of 4 hours of a clerical worker's time for small new operations and 8 hours for new operations with 20-500 employees. In addition, the material cost of developing a HazCom program will be about \$2.40 per small new operation and \$4 per new operation with 20-500 employees.

Table IV-9 provides our estimate of the total cost of developing written HazCom programs for new operations each year.⁴¹

⁴⁰ Annual average based on a data run performed by MSHA's Office of Program Evaluation and Information Resources (PEIR) for the five year period from 1994-1998.

⁴¹ We did not include annual costs for new mines to update their HazCom program because these costs would be offset, more or less, by the avoided annual costs of updating HazCom programs (estimated in Table IV-7) for those existing mines that close each year.

TABLE IV-9: Cost of Developing HazCom Program for New Operations

Operation Size (no. of miners)	No. of New Operations Opening Annually ^a	Annual Recurring First-Year Cost to Develop Program ^b	Total Annual Cost
Coal			
Small (<20)	227	\$520	\$118,058
Large (20-500)	73	\$1,039	\$75,873
Total	300		\$193,931
M/NM			
Small (<20)	570	\$436	\$248,292
Large (20-500)	19	\$870	\$16,538
Total	589		\$264,830

^a No. of new operations opening annually (from MSHA's PEIR special data run).

^b Annually recurring first-year cost to develop program = $[(W_s \times H_s) + (W_c \times H_c) + C]$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal mines and \$44.93 at M/NM mines); H_s is the no. of hours for supervisor to develop HazCom program [8 hr/small mine, and 16 hr/large (20-500) mine]; W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines and \$18.44 at M/NM mines); H_c is the no. of hours for clerical worker to prepare written HazCom program [4 hr/small mine, and 8 hr/large (20-500) mine]; and C is the cost of materials [\$2.40/small mine, and \$4/large (20-500) mine].

Summary of annual costs. Table IV-10 summarizes our estimates of the yearly costs for the mining industry to comply with the written HazCom program requirements under § 47.31 of the final rule.

TABLE IV-10: Summary of Yearly Costs of §47.31 of HazCom Rule

Provision	Coal			M/NM			Total Cost
	Small (< 20)	Large (20-500)	Large (> 500)	Small (< 20)	Large (20-500)	Large (> 500)	
Without a HazCom Program	\$346,453	\$176,280	\$623	\$1,036,898	\$266,129	\$1,566	\$1,827,949
With a HazCom Program	\$782	\$8,581	\$466	\$3,505	\$18,594	\$1,414	\$33,342
New Operations	\$118,058	\$75,873	\$0	\$248,292	\$16,538	\$0	\$458,761
Total	\$465,293	\$260,734	\$1,088	\$1,288,695	\$301,261	\$2,980	\$2,320,051

Source: Table IV-7, Table IV-8, and Table IV-9.

§ 47.32 HazCom program contents.

The compliance costs associated with this section are included in the cost estimates for § 47.31 and other substantive provisions of the final rule.

§ 47.41 Requirements for container labels.

Under this section, operators must ensure that all containers of hazardous chemicals, including all hazardous chemicals produced at the mine, are labeled—with the exception of raw material mined or milled, intermediate chemicals, or by-products resulting from mining or milling if their hazards are already addressed on the MSDSs of the source chemicals. The operator is not allowed to remove or deface existing labels and, when making a label, must ensure that the wording on labels is legible, accurate, and in English. The operator must replace a container label immediately

if it is missing or if the hazard information on the label is unreadable. In addition, for hazardous chemicals produced at the mine, the operator must update labels with any significant new information about the chemicals' hazards within three months of becoming aware of this information.

The operators who receive hazardous chemicals in labeled containers and typically use them directly from those containers will not incur costs. We note, however, that the labeling requirements in the HazCom final rule will alter current MSHA labeling practices in that HazCom's requirements are much broader in scope. MSHA's current labeling standards were developed before 1968 and were for chemicals brought to the mine and put in unlabeled containers. They include no criteria for label contents. The annual compliance cost will involve labeling unlabeled containers and a few temporary portable containers,⁴² replacing worn labels, and replacing labels on containers when the contents and hazards change.

The number of containers that will require labels is directly related to the number of hazardous chemicals on the mine property. Nevertheless, there is no direct relationship between the number of hazardous chemicals and the number of containers to be labeled by the operator because most hazardous chemicals will be stored

⁴² We anticipate that most operators would choose the option under § 47.44 of the final rule, which would not require them to label temporary portable containers.

only in the purchased containers that are already labeled. A few types of hazardous chemicals, such as solvents, lubricants, or paints, may be transferred from a labeled bulk container into one or more different containers for storage or use at the work area.

For this final rule, we estimate that each year about 16.9 percent of small coal operations, 9.2 percent of coal operations with 20-500 employees, 5 percent of coal operations with more than 500 employees, 18.1 percent of small M/NM operations, 9.3 percent of M/NM operations with 20-500 employees, 5 percent of M/NM operations with more than 500 employees, and 50 percent of all coal and M/NM contractors will have to label containers.⁴³ We estimate that, on average, four containers per small coal operation, 52 containers per coal operation with 20-500 employees, 567 containers per coal operation with more than 500 employees coal operation, five containers per small M/NM operation, 50 containers per M/NM operation with 20-500 employees, and 855 containers per M/NM operation with more than 500 employees are used to hold hazardous chemicals and do not have a manufacturer's label.⁴⁴ We estimate that the operator will need to

⁴³ In the REA for the interim final rule, we estimated that each year about 10 percent of small and 4 percent of large (20-500 employees) coal mines, 10 percent of small and 5 percent of large (20-500 employees) M/NM mines, 7 percent of small and 5 percent of large coal contractors (20-500 employees), and 6 percent of small and 5 percent of large M/NM contractors (20-500 employees) would have to label containers. We assumed no large operation with more than 500 employees would have to label containers.

⁴⁴ These estimates reflect our assumption, for the final rule, that approximately one container per miner is used to hold hazardous chemicals and does not have a manufacturer's label. In the REA for the interim final rule, we estimated that, on average, eight containers per small coal operation, six

affix new labels on about 50 percent of these containers in small operations, 35 percent of these containers in operations with 20-500 employees, and 25 percent of these containers in operations with more than 500 employees because the labels become worn or lost, because the containers are replaced, or because the labeling information needs to be changed.

We estimate that it will take about 0.2 hours (12 minutes) for a health and safety professional or supervisor to verify or fill out the labeling information and apply the label to the container. We assume that the material cost will be \$0.10 per label.

Table IV-11 provides our estimate of the total annual cost for operators to comply with the labeling provisions of the final rule.

containers per small M/NM operation, and 30 containers per large (20-500 employees) coal or M/NM operation are used to hold hazardous chemicals and do not have a manufacturer's label.

TABLE IV-11: Cost to Label Containers under § 47.41

Operation Size (no. of miners)	No. of Operators Requiring Labels ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	1,430	\$22	\$31,699
Large (20-500)	247	\$202	\$49,813
Large (> 500)	1.3	\$1,571	\$2,043
Total	1,678		\$83,554
M/NM			
Small (<20)	3,339	\$23	\$75,845
Large (20-500)	408	\$159	\$64,844
Large (> 500)	4	\$1,942	\$7,089
Total	3,750		\$147,778

^a Number of operators requiring labels = $(M \times P_m) + (i \times P_i)$, where M is the total number of mines (from Table IV-3); P_m is the percentage of mines that have to label containers each year [16.9% of small, 9.2% of large (20-500), 5% of large (>500) coal mines; 18.1% of small, 9.3% of large (20-500), 5% of large (>500) M/NM mines]; i is the number of independent contractors (from Table IV-4); and P_i is the percentage of independent contractors that have to label containers each year [50% of small coal, 50% of large (20-500 and >500) coal; 50% of small M/NM, 50% of large (20-500 and >500) M/NM] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b Annual cost per operator = $[(W_s \times H_s) + C] \times (D \times P_c)$, where W_s is the hourly wage rate for health and safety personnel (\$54.92 at coal mines; and \$44.93 at M/NM mines); H_s is the number of hours for health and safety personnel to verify or fill-out the label information and apply it to container = 0.2 hour (12 minutes); C is the cost of material to label a container (C = \$0.10/label); D is the average number of containers per mine [4 for a small coal operation, 52 for large (20-500) coal operation, 567 for a large (>500) coal operation; and 5 for small M/NM operation, 50 for large (20-500), 855 for a large (>500) M/NM operation (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors)]; P_c is the percentage of containers that need new labels in any year [50% of containers in small operations, 35% of containers in large (20-500) operations, and 25% of containers in large (>500) operations].

§ 47.42 Label contents.

The compliance costs associated with this section are included in the cost estimates for § 47.41 of the final rule.

§ 47.43 Label alternatives.

The final rule also permits written alternatives to labeling on-site containers (such as signs, placards, process sheets, or batch tickets for individual, stationary process containers).

The compliance costs associated with this section are included in the cost estimates for § 47.41 of the final rule.

§ 47.44 Temporary, portable containers.

The compliance costs associated with this section are included in the cost estimates for § 47.41 of the final rule.

§ 47.51 Requirements for an MSDS.

This section requires operators to obtain and maintain an MSDS for each hazardous chemical brought onto mine property. It also requires operators to develop an MSDS for each hazardous chemical produced at the mine site.

The operator must keep the MSDSs for hazardous chemicals in a work area accessible to miners during each work shift. They may be in any medium, such as paper or electronic, that does not restrict access. MSDSs may be kept at each work area where the

hazardous chemical is produced or used, or at an alternative site, where a miner can readily access it in an emergency. Operators must retain MSDSs for as long as the hazardous chemicals are known to be present at the mine. They must also notify miners at least three months before disposing any MSDS.

MSDS development. Every hazardous chemical received by a mine operator from a chemical manufacturer, distributor, or other supplier will have an MSDS supplied upon request. As a result, the only hazardous chemicals for which the operator will need to develop an MSDS will be those that are produced by the mining operation. For this final rule, we estimate that about 90 percent of small coal operations, 72.8 percent of coal operations with 20-500 employees, and 5 percent of coal operations with more than 500 employees; 33.6 percent of small M/NM operations, 16.7 percent of M/NM operations with 20-500 employees, and 5 percent of M/NM operations with more than 500 employees; 98.9 percent of small coal contractors, 95.1 percent of coal contractor operations with 20-500 employees, and 50 percent of coal contractor operations with more than 500 employees; and 98.5 percent of small M/NM contractors, 85.8 percent of M/NM contractor operations with 20-500 employees, and 50 percent of M/NM contractor operations

with more than 500 employees will have to develop one or more MSDSs for hazardous chemicals they produce.⁴⁵

There are two principal factors that affect the cost to a mine operator for developing an MSDS. The first factor is the number of potentially hazardous chemicals that are mined or produced at the mining operation. The average number of potentially hazardous chemicals produced at mining operations varies considerably among mining commodities. For any given type of mining commodity and method of mining, however, the number of these hazardous products is expected to vary little by size of mine. We estimate that an average of one MSDS per small operation, two MSDSs per coal operation with 200-500 employees, three MSDSs per coal operation with more than 500 employees, four MSDSs per M/NM operation with 20-500 employees, and six MSDSs per operation with more than 500 employees will need to be developed.⁴⁶

The second factor is the time necessary to investigate the available scientific evidence for any potentially hazardous safety

⁴⁵ In the REA for the interim final rule, we estimated that each year about 21 percent of small coal mines, 4 percent of coal mines with 20-500 employees, 27 percent of small M/NM mines, 5 percent of M/NM mines with 20-500 employees, 7 percent of small coal contractors, 5 percent of coal contractors with 20-500 employees, 6 percent of small M/NM contractors, and 5 percent of M/NM contractors with 20-500 employees would have to develop one or more MSDSs for hazardous chemicals they produce. We assumed no operation with more than 500 employees would have to develop any MSDSs for hazardous chemicals they produce.

⁴⁶ In the REA for the interim final rule, we estimated that an average of one MSDS per small operation, two MSDSs per coal operation with 20-500 employees, and four MSDSs per M/NM operation with 20-500 employees would need to be developed

or health consequences from exposure to the chemical or from its potential by-products. We estimate that it would require from 0.5 hours (30 minutes) to obtain an existing MSDS for a common chemical from MSHA's (or some other) website to 8 hours of research to develop an MSDS for a rarer, more complex chemical. On average, we estimate that it would take a supervisor 2 hours to investigate a potentially hazardous mining chemical and to create the MSDS. In addition, it would require an average of 1 hour of a clerical worker's time to type and file the MSDS. We estimate the material cost for developing each MSDS to be about \$2 including printing references (an average of 20 pages at \$0.10 per page).

We further estimate that 25 percent of the MSDSs will need to be updated each year (an MSDS will require an update on the average of once every 4 years), requiring, on average, 1 hour of a supervisor's time and 0.5 hours of a clerical worker's time with a cost for materials of about \$1 per MSDS.

Table IV-12 provides our estimate of the total cost of developing MSDSs for chemicals produced at a mine. First-year costs were adjusted using the procedure described in the methodology section earlier in this chapter and converted to annualized costs using an annualization factor of 7 percent.

TABLE IV-12: Cost of MSDS Development for Chemicals Produced at Existing Operations

Operation Size (no. of miners)	No. of Operators without MSDSs ^a	First Year Cost to Develop MSDS ^b	Total First Year Cost	Annually Recurring Cost per Operator ^c	Annual Recurring Cost	Adjusted First Year Cost ^d	Total Annualized Cost ^e	Total Yearly Cost ^f
Coal								
Small (< 20)	3,453	\$131	\$453,735	\$16	\$56,717	\$397,018	\$27,791	\$84,508
Large (20-500)	873	\$263	\$229,353	\$33	\$28,669	\$200,684	\$14,048	\$42,717
Large (> 500)	1.3	\$394	\$513	\$49	\$64	\$448	\$31	\$95
Total	4,326		\$683,600		\$85,450	\$598,150	\$41,871	\$127,321
M/NM								
Small (< 20)	6,364	\$110	\$701,923	\$14	\$87,740	\$614,183	\$42,993	\$130,733
Laarge (20-500)	715	\$441	\$315,320	\$55	\$39,415	\$275,905	\$19,313	\$58,728
Large (> 500)	4	\$662	\$2,416	\$83	\$302	\$2,114	\$148	\$450
Total	7,082		\$1,019,659		\$127,457	\$892,202	\$62,454	\$189,912

^a Number of operators without MSDSs = $(M \times P_m) + (i \times P_i)$, where M is the total number of mines (from Table IV-3); P_m is the percentage without MSDSs [90% of small, 72.8% of large (20-500), and 5% of large (>500) coal mines; 33.6% of small, 16.7% of large (20-500), and 5% of large M/NM mines]; i is the number of independent contractors (from Table IV-4); and P_i is the percentage of independent contractors without MSDSs [98.9% of small coal, 85.1% of large (20-500), and 50% large coal; 98.5% of small M/NM, 85.8% of large (20-500), and 50% of large M/NM] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b First-year cost to develop MSDS = $[(W_s \times H_s) + (W_c \times H_c) + C] \times N$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H_s is the number of hours for supervisor to develop MSDS (2 hours/MSDS); W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines; \$18.44 at M/NM mines); H_c is the number of hours for clerical worker to prepare MSDS (1 hour/MSDS); C is the cost of materials (\$2/MSDS); and N is the number of MSDSs developed [1/small, 2/large (20-500) coal, 3/large (>500) coal operations; 1/small M/NM, 4/large (20-500) M/NM, 6/large (>500) M/NM operations].

^c Annually recurring cost per operator = $[(W_s \times H_s) + (W_c \times H_c) + C] \times N \times 25\%$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H_s is the # of hours for supervisor to update MSDS (1 hr/MSDS); W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines; \$18.44 at M/NM mines); H_c is the number of hours for clerical worker to update MSDS (0.5 hr/MSDS); C is the cost of materials to update program (\$1/MSDS); N is the number of MSDS developed [1/small, 2/large (20-500) coal, 3/large (>500) coal operations; 1/small M/NM, 4/large (20-500) M/NM, 6/large (>500) M/NM operations]; and 25% is the percentage of MSDSs updated each year.

^d Adjusted first year cost = total first year costs - annual recurring cost.

^e Adjusted first year cost annualized = adjusted first year cost X 0.07, where 0.07 is the annualization factor.

^f Total yearly cost = annual recurring cost + adjusted first year cost annualized.

New operations. Based on PEIR data for the years 1994 thru 1998, we estimate that 227 small coal operations, 73 coal operations with 20-500 employees, 570 small M/NM operations, and 19 M/NM operations with 20-500 employees will open each year. The average cost for developing MSDSs at a new operation will be the same as that for an existing operation of the same size. That is, it will take an average of 2 hours of a supervisor's time, 1 hour of a clerical worker's time, and \$2 for materials to develop an MSDS.

Table IV-13 provides our estimate of the compliance costs for new operations each year to develop MSDSs.

TABLE IV-13: Cost of MSDS Development for Chemicals Produced at New Mines

Operation Size (no. of miners)	No. of New Operations Opening Annually ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	227	\$131	\$29,832
Large (20-500)	73	\$263	\$19,187
Total	300		\$49,020
M/NM			
Small (<20)	570	\$110	\$62,871
Large (20-500)	19	\$441	\$8,383
Total	589		\$71,254

^a Number of new operations opening annually (from MSHA's PEIR special run data; see Table IV-9).

^b Annual cost per operator = $\{[(W_s \times H_s) + (W_c \times H_c) + M] \times N_1\}$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations, \$44.93 at M/NM operations), H_s is the # of hours for supervisor to develop MSDS (2 hours/MSDS); W_c is the hourly wage rate for clerical (\$19.58 at coal operations, \$18.44 at M/NM operations); H_c is the # of hours for clerical worker to prepare MSDS (1 hour/MSDS); M is the cost of materials (\$2/MSDS); and N_1 is the average # of MSDSs developed/mine [1/small, 2/large (20-500) coal operation; and 1/small, 4/large (20-500) M/NM operation].

Obtaining MSDSs. In the REA for the interim final rule, we assumed that operators already possess MSDSs (supplied to the operators by the chemical manufacturers at the time of purchase) for all hazardous chemicals brought to the mine and that, therefore, this provision would impose no MSDS costs on operators for the hazardous chemicals they use.

Several commenters complained about the absence of MSDS costs for hazardous chemicals used by operators, arguing that (1) in some cases, the MSDS for the hazardous chemical was not included

in the shipment; (2) there is no existing requirement to obligate operators to retain MSDSs for hazardous chemicals, and some operators throw out MSDSs upon receiving them from the manufacturer or distributor or subsequently lose some or all of them; and therefore (3) many operators will have to obtain missing MSDSs in order to be in compliance with the final HazCom rule. In addition, commenters argued that operators must also bear the cost of locating all of the MSDSs and assembling them.

In response to these comments, we have added costs in this REA for operators (not currently in compliance) to obtain and assemble MSDSs, as required under § 47.51(b) of the final HazCom rule. An operator's cost of obtaining and assembling MSDSs will depend on whether the operator chooses to take advantage of the compliance option of using a chemical database on the internet to access MSDSs. We estimate that 50 percent of small operations, 90 percent of operations with 20-500 employees, and all operations with more than 500 employees will rely on the internet to access MSDSs.

For operators using the internet to access MSDSs, we estimate that accessing MSDSs will require 0.5 hours (30 minutes) of a supervisor's time and 0.5 hours (30 minutes) of a clerical worker's time, regardless of mine size, for both coal and M/NM mines.

For operators not using the internet to access MSDSs, we estimate that small coal and M/NM operators will require 2 hours

of a supervisor's time and 4 hours of a clerical worker's time to obtain and assemble MSDSs and that coal and M/NM operators with 20-500 employees will require 4 hours of a supervisor's time and 8 hours of a clerical worker's time to obtain and assemble MSDSs.

The average cost for operators of a particular type (coal or M/NM) and size category to obtain and assemble MSDSs is a weighted average of (1) the costs for operators of that type and size category who use the internet to access MSDSs and (2) the costs for operators of that type and size category who do not use the internet to access MSDSs.

Table IV-14 provides our estimate of the cost for operators to obtain and assemble MSDSs. This one-time, first-year cost has been converted to annualized costs using an annualization factor of 7 percent.

TABLE IV-14: Cost to Obtain MSDSs at Existing Operations

Operation Size (no. of miners)	No. of Operators without MSDSs ^a	Weighted Average Cost per Operator ^b	Total Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	3,453	\$113	\$389,120	\$27,238
Large (20-500)	873	\$71	\$62,091	\$4,346
Large (> 500)	1.3	\$37	\$48	\$3
Total	4,326		\$451,260	\$31,588
M/NM				
Small (<20)	6,364	\$98	\$621,437	\$43,501
Large (20-500)	715	\$61	\$43,768	\$3,064
Large (> 500)	3.7	\$32	\$116	\$8
Total	7,082		\$665,321	\$46,572

^a Number of operators without MSDSs (from Table IV-12).

^b Weighted average cost per operator = $\{P_c \times [(W_s \times H_{sc}) + (W_c \times H_{cc})] + \{(100\% - P_c) \times [(W_s \times H_{so}) + (W_c \times H_{co})]\}$; where P_c is the % of mines with internet access [50% of small coal and M/NM, 90% of large (20-500) coal and M/NM, 100% of large (>500) coal and M/NM operations]; W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H_{sc} is the number of hours for a supervisor to obtain MSDSs (0.5 hours for each coal and M/NM operation); W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines; \$18.44 at M/NM mines); H_{cc} is the number of hours for a clerical worker to gather and assemble MSDSs (0.5 hours for each coal and M/NM operation); $(100\% - P_c)$ is the % of mines without internet access; H_{so} is the number of hours for a supervisor to obtain MSDSs (2 hours for each small coal and M/NM operation, 4 hours for each large (20-500) coal and M/NM operation); and H_{co} is the number of hours for a clerical worker to gather and assemble MSDSs [4 hours for each small coal and M/NM mine, 8 hours for each large (200-500) coal and M/NM operation].

^c Total annualized cost = total cost X 0.07, where 0.07 is the annualization factor.

New operations. Based on PEIR data for the years 1994 thru 1998, we estimate that 227 small coal operations, 73 coal operations with 20-500 employees, 570 small M/NM operations, and 19 M/NM operations with 20-500 employees will open each year. We assume that the average cost for obtaining and assembling MSDSs at

a new operation will be the same as that for an existing operation of the same size.

Table IV-15 provides our estimate of the cost for new operations each year to obtain and assemble MSDSs.

TABLE IV-15: Cost to Obtain MSDSs for New Mines

Operation Size (no. of miners)	No. of New Operations Opening Annually ^a	Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	227	\$113	\$25,584
Large (20-500)	73	\$71	\$5,194
Total	300		\$30,778
M/NM			
Small (<20)	570	\$98	\$55,662
Large (20-500)	19	\$61	\$1,164
Total	589		\$56,825

^a Number of new operations opening annually (from Table IV-9).

^b Weighted average cost per operator = $\{P_c \times [(W_s \times H_{sc}) + (W_c \times H_{cc})] + \{(100\% - P_c) \times [(W_s \times H_{so}) + (W_c \times H_{co})]\}$; where P_c is the % of mines with internet access [50% of small coal and M/NM, and 90% of large (20-500) coal and M/NM]; W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H_{sc} is the number of hours for a supervisor to obtain MSDSs (0.5 hours for each coal and M/NM operation); W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines; \$18.44 at M/NM mines); H_{cc} is the number of hours for a clerical worker to gather and assemble MSDSs (0.5 hours for each coal and M/NM operation); $(100\% - P_c)$ is the % of mines without internet access; H_{so} is the number of hours for a supervisor to obtain MSDSs (2 hours for each small coal and M/NM operation, 4 hours for each large (20-500) coal and M/NM operation); and H_{co} is the number of hours for a clerical worker to gather and assemble MSDSs [4 hours for each small coal and M/NM mine, 8 hours for each large (200-500) coal and M/NM operation].

MSDS

maintenance. The costs associated with MSDS maintenance are (1) for keeping MSDSs current (updated as needed) and readily available in each work area, and (2) if the operator desires, for removing MSDSs for hazardous chemicals no longer present at the mine.⁴⁷ An operator's cost of maintaining MSDSs will depend on whether the operator chooses to take advantage of the compliance option of using a chemical database on the internet to access MSDSs.⁴⁸

For operators using the internet to access MSDSs, we estimate that maintaining MSDSs will require 0.25 hours (15 minutes) of a clerical worker's time, regardless of mine size, for both coal and M/NM mines.

For operators not using the internet to access MSDSs, we assume updated MSDSs will be provided by the manufacturer of the hazardous chemicals (or, alternatively, can be obtained from another source). We estimate that each small operator will need to maintain an average of 40 MSDSs for hazardous chemicals present on mine property. Operators with 20-500 employees will need to maintain an average of 70 MSDSs, and operators with more than 500 employees will need to maintain an average of 120 MSDSs. Assuming

⁴⁷ In the REA for the interim final rule, we did not include a cost for the operators' annual removal of MSDSs for hazardous chemicals no longer present at the mine.

⁴⁸ In the REA for the interim final rule, we did not develop separate MSDS maintenance cost estimates for operators with and without internet access to a chemical database.

the operator does not rely on the internet to access MSDSs, we estimate that it will require an average of 0.05 hours (3 minutes) of a clerical worker's time to maintain each MSDS in a notebook or other location in the work area. We did not include the cost for maintaining a second or back-up copy of the MSDSs for the operator's central files.

In addition, we assume that operators without internet access to MSDSs will remove some of their physical copies of MSDSs over time.⁴⁹ We assume that these operators will change 50 percent of MSDSs per year, 50 percent of which they will discard (therefore, removing a total of 25 percent of their MSDSs annually). We further assume that, to comply with § 47.55(b) of the final rule, mine supervisors will require three minutes of preparation per MSDS before announcing the MSDS's removal during periodic safety meetings.⁵⁰

The average cost for operators of a particular type (coal or M/NM) and size category to maintain MSDSs is a weighted average of (1) the costs for operators of that type and size category who use the internet to access MSDSs and (2) the costs for operators of that type and size category who do not use the internet to access

⁴⁹ We assume that operators with internet access to a chemical database will choose to keep electronic copies of the MSDSs, which they would not need to or choose to remove over time (including those for hazardous chemicals no longer present at the mine).

⁵⁰ We assume that these MSDS removal announcements would not impose additional cost in the form of miners' time to hear the announcements because these costs would already be covered under existing under part 46 and part 48.

MSDSs. Table IV-16 provides our estimate of the total annual cost for operators to maintain MSDSs.⁵¹

TABLE IV-16: Cost for MSDS Maintenance

Operation Size (no. of miners)	No. of Operators without MSDSs ^a	Weighted Average Annual Cost per Operator ^b	Total Annual Cost ^c
Coal			
Small (< 20)	3,453	\$36	\$123,455
Large (20-500)	873	\$16	\$14,017
Large (> 500)	1.3	\$5	\$6
Total	4,326		\$137,478
M/NM			
Small (<20)	6,364	\$32	\$203,497
Large (20-500)	715	\$15	\$10,388
Large (> 500)	4	\$5	\$17
Total	7,082		\$213,902

^a Number of operators without MSDSs (from Table IV-12).

^b Annual cost per operator = $\{(P_c \times W_c \times H_c) + [(100\% - P_c) \times W_c \times H_{co} \times N] + [(100\% - P_c) \times R \times N \times W_s \times H_{so}]\}$, where P_c is the % of mines with internet access [50% of small coal and M/NM, 90% of large (20-500) coal and M/NM, 100% of large (>500) coal and M/NM operations]; W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines; \$18.44 at M/NM mines); H_c is 0.25 hour per operation to maintain MSDSs; $(100\% - P_c)$ is the % of operations without internet access; H_{co} is 0.05 hour/MSDS to maintain it; N is the average number of MSDS/operation [40/small, 70/large (20-500), and 120/large (>500) operations]; R is the % of MSDS removed annually for operations without internet access and $R = 25\%$; W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); and H_{so} is 0.05 hour/MSDS for a supervisor to prepare MSDS removal announcement.

⁵¹ We did not include separate costs for new mines to maintain their MSDSs each year because these costs would be offset, more or less, by the avoided annual costs of maintaining MSDSs for those existing mines that close each year.

Summary of annual costs. Table IV-17 provides our estimate of the total yearly costs for operators to comply with the MSDS provisions of the final rule.

TABLE IV-17: Summary of Yearly Costs for MSDSs

Provision	Coal			M/NM			Total
	Small (< 20)	Large (20-500)	Large (> 500)	Small (< 20)	Large (20-500)	Large (> 500)	
MSDS Development for Existing Operators	\$84,508	\$42,717	\$95	\$130,733	\$58,728	\$450	\$317,232
MSDS Development for New Operators	\$29,832	\$19,187	\$0	\$62,871	\$8,383	\$0	\$120,273
Obtain MSDSs for Existing Operators	\$27,238	\$4,346	\$3	\$43,501	\$3,064	\$8	\$78,161
Obtain MSDSs for New Operators	\$25,584	\$5,194	\$0	\$55,662	\$1,164	\$0	\$87,604
Maintain MSDSs for Existing Operators	\$123,455	\$14,017	\$6	\$203,497	\$10,388	\$17	\$351,380
Total	\$290,618	\$85,463	\$105	\$496,264	\$81,726	\$475	\$954,650

Source: Table IV-12, Table IV-13, Table IV-14, Table IV-15, and Table IV-16.

§ 47.52 MSDS contents.

The compliance costs associated with this section are included in the cost estimates for § 47.51 of the final rule.

§ 47.53 Alternative for hazardous waste.

The compliance costs associated with this section are included in the cost estimates for § 47.51 of the final rule.

§ 47.54 Availability of an MSDS.

The compliance costs associated with this section are included in the cost estimates for § 47.51 of the final rule.

§ 47.55 Retaining an MSDS.

The compliance costs associated with this section are included in the cost estimates for § 47.51 of the final rule.

§ 47.61 Requirement for HazCom training.

Under this section of the final rule, operators must ensure that all miners exposed to hazardous chemicals receive HazCom training. Each miner must receive this training before initial assignment, whenever a new chemical hazard is introduced into the work area, and whenever the miner is transferred to an area where the chemical hazards differ from those for which the miner received training. The operator must train the miner about the hazardous chemicals in the miner's work area, the types of hazards associated with those chemicals, the measures that miners can take to protect themselves against these chemical hazards, and the location and availability of the written HazCom program and MSDSs.

Develop HazCom training. The operator will need to develop a HazCom training program to explain the HazCom rule and to provide hazard training about individual hazardous chemicals at the mine.

We estimate that about 76.9 percent of small coal operations, 48.8 percent of coal operations with 20-500 employees, and 30

percent of coal operations with more than 500 employees; 76.3 percent of small M/NM operations , 49.2 percent of M/NM operations with 20-500 employees, and 5 percent of M/NM operations with more than 500 employees; 98.9 percent of small coal contractors, 85.1 percent of coal contractor operations with 20-500 employees, and 50 percent of coal contractors operations with more than 500 employees; and 98.5 percent of small M/NM contractor operations, 85.8 percent of M/NM contractor operations with 20-500 employees, and 50 percent of M/NM contractor operations with more than 500 employees have to develop an initial HazCom training program.⁵²

We estimate that it will require 4 hours of a supervisor's time and 2 hours of a clerical worker's time to develop a HazCom training program for small operations, 8 hours of a supervisor's time and 4 hours of a clerical worker's time for operations with 200-500 employees, and 12 hours of a supervisor's time and 6 hours of a clerical worker's time for operations with more than 500 employees.

Table IV-18 provides our estimate of the total cost to develop an initial HazCom training program. This one-time, first-

⁵² In the REA for the interim final rule, we estimated that each year about 70 percent of small coal mines, 63 percent of coal mines with 20-500 employees, 81 percent of small M/NM mines, 67 percent of M/NM mines with 20-500 employees, 35 percent of small coal contractors, 25 percent of coal contractors with 20-500 employees, 30 percent of small M/NM contractors, and 26 percent of M/NM contractors with 20-500 employees would have to develop an initial HazCom training program. We assumed no operation with more than 500 employees would have to develop an initial HazCom training program.

year cost has been annualized using an annualization factor of 7 percent.

TABLE IV-18: Cost for Operators to Develop HazCom Training

Operation Size (no. of miners)	No. of Operators Without a HazCom Training Program ^a	Additional First Year Cost per Operator ^b	Total First Year Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	3,309	\$259	\$856,393	\$59,948
Large (20-500)	683	\$518	\$353,756	\$24,763
Large (> 500)	3	\$777	\$2,174	\$152
Total	3,995		\$1,212,324	\$84,863
M/NM				
Small (< 20)	10,522	\$217	\$2,279,148	\$159,540
Large (20-500)	1,281	\$433	\$554,871	\$38,841
Large (> 500)	4	\$650	\$2,372	\$166
Total	11,807		\$2,836,391	\$198,547

^a No. of operators without a HazCom training program = $(M \times P_m) + (i \times P_i)$, where M is the total number of mines (from Table IV-3); P_m is the percentage without a HazCom training program [76.9% of small, 48.8% of large (20-500), 30% of large (>500) coal operations; and 76.3% of small, 49.2% of large (20-500), 5% of large (>500) M/NM operations]; i is the number of independent contractors (from Table IV-4); and P_i is the percentage of independent contractors without a HazCom training program [98.9% of small, 85.1% of large (20-500), 50% of large (>500) coal; and 98.5% of small, 85.8% of large (20-500), 50% of large (>500) M/NM] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b First-year cost to develop program = $[(W_s \times H_s) + (W_c \times H_c)]$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations; and \$44.93 at M/NM operations); H_s is the no. of hours for supervisor to develop HazCom training program (4 hr/small operation, 8 hr/large (20-500) operation, and 12 hr/large (>500) operation); W_c is the hourly wage rate for clerical worker (\$19.58 at coal operations; \$18.44 at M/NM operations); and H_c is the # of hours for clerical worker to prepare written program (2 hr/small operation, 4 hr/large (20-500) operation, and 6 hr/large (>500) operation).

^c Annualized first-year cost = 0.07 x first-year cost (one-time).

Training program administration. For this analysis, we assume that administering the HazCom training program will include such things as (1) coordinating and integrating HazCom training with the mine's training program under 30 CFR part 48 or part 46, (2) keeping track of training needed and provided, (3) scheduling training as needed, and (4) purchasing training materials.

We estimate that it will require 1 hour of a supervisor's time and 0.5 hours (30 minutes) of a clerical worker's time annually to administer the HazCom training program at small operations, 2 hours of a supervisor's time and 1 hour of a clerical worker's time at operations with 20-500 employees, and 3 hours of a supervisor's time and 1.5 hours of a clerical worker's time at operations with more than 500 employees.

Table IV-19 provides our estimate of the annual operator costs for administration of the HazCom training program.

TABLE IV-19: Annual Cost to Administer HazCom Training Program

Operation Size (no. of miners)	No. of Operators without a HazCom Training Program ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	3,309	\$65	\$214,098
Large (20-500)	683	\$129	\$88,439
Large (> 500)	3	\$194	\$544
Total	3,995		\$303,081
M/NM			
Small (< 20)	10,522	\$54	\$569,787
Large (20-500)	1,281	\$108	\$138,718
Large (> 500)	4	\$162	\$593
Total	11,807		\$709,098

^a Number of operators without a HazCom training program (from Table IV-18).

^b Annual cost to administer training program = $(W_s \times H_s) + (W_c \times H_c)$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations; \$44.93 at M/NM operations); H_s is the no. of hours for supervisor to administer HazCom program [1 hr/small, 2 hr/large (20-500), and 3 hr/large (>500) operations]; W_c is the hourly wage rate for clerical worker (\$19.58 at coal operations; \$18.44 at M/NM operations); and H_c is the no. of hours for clerical worker to administer training program [0.5 hr/small, 1 hr/large (20-500), and 1.5 hr/large (>500) operations].

Initial HazCom training. For initial and all other HazCom training, we assume that one supervisor per operation (regardless of size) will provide HazCom training; consequently the number of workers per training supervisor will vary by the size of the operation.

For the final rule, based on our own research and experience and in response to comments, we estimate that a mine supervisor will require 2 hours to prepare lesson materials for the initial HazCom training in a small operation, 4 hours in an operation with

20-500 employees, and 8 hours in an operation with more than 500 employees.⁵³ The cost of training materials will average about \$5 per miner (including the trainer).⁵⁴

Table IV-20 provides our estimate of the cost for mine operators to prepare the initial HazCom training. This one-time, first-year cost has been annualized using an annualization factor of 7 percent.

⁵³ In the REA for the interim final rule, we assumed that the amount of time required to train miners about the HazCom rule, the operation's HazCom program, and chemical hazards in the miners' work area was not dependent on the size of the mining operation. On average, we estimated that a mine supervisor would require 2 hours to prepare lesson materials for the initial HazCom training.

⁵⁴ Unless otherwise specified, the number of miners per mine refers specifically to the average number of miners per mine of a given type (i.e., coal, M/NM) and size category (i.e., <20, 20-500, >500 employees), for mines which are not in compliance with the particular provision of the final rule under consideration.

TABLE IV-20: Cost for Mine Operators to Prepare Initial HazCom Training

Operation Size (no. of miners)	No. of Operators without HazCom Training ^a	First Year Cost for Preparing HazCom Training ^b	Total First Year Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	3,309	\$135	\$446,129	\$31,229
Large (20-500)	683	\$550	\$375,623	\$26,294
Large (> 500)	3	\$3,149	\$8,818	\$617
Total	3,995		\$830,571	\$58,140
M/NM				
Small (< 20)	10,522	\$115	\$1,208,601	\$84,602
Large (20-500)	1,281	\$445	\$569,626	\$39,874
Large (> 500)	4	\$4,414	\$16,113	\$1,128
Total	11,807		\$1,794,340	\$125,604

^a Number of operators without HazCom training (from Table IV-18).

^b First-year cost for initial training = $(W_s \times H_s) + (C \times N)$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H_s is the number of hours for supervisor to prepare lesson [2 hr/small, 4 hr/large (20-500), and 8 hr/large (>500) operations]; C is the cost of materials per miner (\$5/miner); and N is the average number of miners per operation [5 for small coal, 66 for large (20-500) coal, 542 for large (>500) coal operations; and 5 small M/NM, 53 for large (20-500) M/NM, 811 for large (>500) M/NM operations] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^c Annualized first-year cost = $0.07 \times$ first-year cost (one-time).

In the interim final rule, we delayed the effective date of the rule for one year, which would have allowed operators to incorporate HazCom training into their existing part 46 or part 48 miner training program (with the actual HazCom training therefore attributable to, and already included in, the costs of the existing part 46 and part 48 rules). However, the effective date of this final rule no longer gives operators a complete year to

provide training. Therefore, for operators unable to incorporate first year HazCom training into their part 46 and part 48 training cycle, the cost for miners to receive initial HazCom training is properly attributable to the final rule (rather than to the existing part 46 and part 48 rules).

We assume that all small coal and M/NM operators, 75 percent of coal and M/NM operations with 20-500 employees, and 50 percent of coal and M/NM operations with more than 500 employees will have to provide HazCom training that has not been incorporated into their part 46 or part 48 training cycle. We estimate that initial HazCom training will take an average of 1 hour.

Table IV-21 provides our estimate of the cost for miners to receive initial HazCom training that is properly attributable to the final HazCom rule. This one-time, first-year cost has been annualized using an annualization factor of 7 percent.

TABLE IV-21: Cost for Miners to Receive Initial HazCom Training (First Year Only)

Operation Size (no. of miners)	No. of Operators Need to Provide Separate HazCom Training ^a	First Year Cost per Operator ^b	Total First Year Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	3,309	\$195	\$646,067	\$45,225
Large (20-500)	513	\$1,908	\$977,637	\$68,435
Large (> 500)	1	\$15,269	\$21,376	\$1,496
Total	3,822		\$1,645,080	\$115,156
M/NM				
Small (< 20)	10,522	\$144	\$1,515,013	\$106,051
Large (20-500)	961	\$1,095	\$1,051,776	\$73,624
Large (> 500)	2	\$16,111	\$29,402	\$2,058
Total	11,485		\$2,596,191	\$181,733

^a Number of operators need to provide separate HazCom training = (M x P), where M is the number of operators without a HazCom training program (from Table IV-18); and P is the % of mines that have not already provided first year HazCom training [100% of small coal and M/NM, 75% of large (20-500) coal and M/NM, and 50% of large (>500) coal and M/NM mines].

^b First-year cost for HazCom training per operator = (W_m x H_m x A_m) + (W_s x H_m), where W_m is the hourly wage rate for miner (\$28.07 at coal mines; and \$19.81 at M/NM mines); H_m is the number of hours it takes for miners to receive HazCom training and H_m = 1 hour; and A_m is the average number of miners per operation [5 for small coal, 66 for large (20-500) coal, 542 for large (>500) coal operations; and 5 small M/NM, 53 for large (20-500) M/NM, 811 for large (>500) M/NM operations] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors); W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines).

^c Annualized first-year cost = 0.07 x first-year cost (one-time).

New miner training. Under amendments to part 46 and part 48 in the HazCom final rule, new miners must be trained about the chemical hazards in the work area prior to their initial assignment.

In the interim final rule, we delayed the effective date of the rule for one year, which would have allowed operators to incorporate new miner HazCom training into their existing part 46 or part 48 miner training program (with the actual new miner HazCom training therefore attributable to, and already included in, the costs of the existing part 46 and part 48 rules). However, the effective date of this final rule no longer gives operators a complete year to provide training. Therefore, for operators unable to incorporate first year new miner HazCom training into their part 46 and part 48 training cycle, the cost for new miners to receive initial HazCom training is properly attributable to the final rule (rather than to the existing part 46 and part 48 rules).

Again, we assume that all small coal and M/NM operators, 75 percent of coal and M/NM operators with 20-500 employees, and 50 percent of coal and M/NM operators with more than 500 employees will have to provide new miner HazCom training that has not been incorporated into their part 46 or part 48 training cycle. We estimate that operators will usually conduct this HazCom training for new miners one-on-one and that the training will last about 1 hour. Based on industry experience during the past five years, we estimate an annual miner turnover rate of 7 percent for coal operators and 19 percent for M/NM operators.

Table IV-22 provides our estimate of the cost for new miners to receive initial HazCom training that is properly attributable

to the final HazCom rule. This one-time, first-year cost has been annualized using an annualization factor of 7 percent.

TABLE IV-22: Cost for New Miners to Receive Initial HazCom Training (First Year Only)

Operation Size (no. of miners)	No. of Operators Need to Provide Separate Initial HazCom Training ^a	One-Time Cost per Operator ^b	Total Cost	Total Annualized Cost ^c
Coal				
Small (< 20)	3,309	\$29	\$96,103	\$6,727
Large (20-500)	513	\$383	\$196,504	\$13,755
Large (> 500)	1	\$3,149	\$4,408	\$309
Total	3,822		\$297,015	\$20,791
M/NM				
Small (< 20)	10,522	\$62	\$647,158	\$45,301
Large (20-500)	961	\$652	\$626,278	\$43,839
Large (> 500)	2	\$9,976	\$18,206	\$1,274
Total	11,485		\$1,291,641	\$90,415

^a Number of operators need to provide separate Initial HazCom training = (M x P), where M is the number of operators without a HazCom training program (from Table IV-18); and P is the % of mines that have not already provided first year HazCom training [100% of small coal and M/NM, 75% of large (20-500) coal and M/NM, and 50% of large (>500) coal and M/NM mines].

^b One-time cost per operator (for initial HazCom Training for new miners) = $[(W_m + W_s) \times H \times P \times N]$, where W_m is the hourly wage rate for miner (\$28.07 at coal mines; \$19.81 at M/NM mines); W_s is the hourly wage rate for supervisor (\$54.92 at coal mines; \$44.93 at M/NM mines); H is the # of hours of initial HazCom training given to a new miner by a supervisor, and H = 1 hour; P is the annual employee turnover rate (7% for coal; 19% for M/NM); and N is the average number of miners per operation [5 for small coal, 66 for large (20-500) coal, 542 for large (>500) coal operations; and 5 small M/NM, 53 for large (20-500) M/NM, 811 for large (>500) M/NM operations (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^c Annualized first-year cost = 0.07 x first-year cost (one-time).

We anticipate that operators will incur an additional cost for new miner training in the form of HazCom training materials. We estimate that HazCom training material costs will be \$5 per new miner. Again, based on industry experience during the past five

years, we estimate an annual miner turnover rate of 7 percent for coal operators and 19 percent for M/NM operators.

Table IV-23 provides our estimate of the cost each year of HazCom materials to train new miners.

TABLE IV-23: Annual Cost for Initial HazCom Training for New Miners

Operation Size (no. of miners)	No. of Operators without Initial HazCom Training ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	3,309	\$2	\$5,790
Large (20-500)	683	\$23	\$15,785
Large (> 500)	3	\$190	\$531
Total	3,992		\$22,107
M/NM			
Small (< 20)	10,522	\$5	\$49,981
Large (20-500)	1,281	\$50	\$64,492
Large (> 500)	4	\$770	\$2,812
Total	11,803		\$117,285

^a Number of operators without Initial HazCom program (from Table IV-18).

^b Annual cost per operator (for initial HazCom Training for new miners) = (C x P x N), where C is the cost of materials per miner (\$5/miner); P is the annual employee turnover rate (7% for coal; 19% for M/NM); and N is the average number of miners per operation [5 for small coal, 66 for large (20-500) coal, 542 for large (>500) coal operations; and 5 small M/NM, 53 for large (20-500) M/NM, 811 for large (>500) M/NM operations (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors)].

New operations. Based upon a data run for years 1994 thru 1998 conducted by MSHA's Office of Program Evaluation and Information Resources (PEIR), we estimate that 227 small coal operations, 73 coal operations with 20-500 employees, 570 small M/NM operations, and 19 M/NM operations with 20-500 employees will

open each year. These new operations will need to develop a HazCom training program and provide initial HazCom training.⁵⁵

We assume that the costs of developing a HazCom training program and providing initial HazCom training will be the same for new operations as for existing operations. We therefore estimate that it will require 4 hours of a supervisor's time and 2 hours of a clerical worker's time to develop a HazCom training program for new small operations and 8 hours of a supervisor's time and 4 hours of a clerical worker's time for new operations with 20-500 employees. Based on our own technical review and in response to comments, we further estimate that a mine supervisor will require 2 hours at a new small operation and 4 hours at a new operation with 20-500 employees to prepare lesson materials to train miners about the HazCom rule, about the operation's HazCom program, and about the chemical hazards in the miners' work area. The cost of training materials will average about \$5 per miner.⁵⁶

Table IV-24 provides our estimate of the cost each year for new operations to develop a HazCom training program and to prepare initial HazCom training.

⁵⁵ We did not include annual costs for new mines to administer HazCom training each year because these costs would be offset, more or less, by the avoided annual costs of administering HazCom training (estimated in Table IV-19) for those existing mines that close each year.

⁵⁶ Because the costs here are for new mines, the number of miners per mine refers to the average number of miners per mine for all mines of a given type and size category (not just those which are currently not in compliance with this provision).

TABLE IV-24: Cost of Developing HazCom Training Program and Preparing Initial Training for New Operations

Mine Size (no. of miners)	No. of Operations Opening or Re- Opening Annually ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	227	\$394	\$89,365
Large (20-500)	73	\$1,067	\$77,917
Total	300		\$167,283
M/NM			
Small (< 20)	570	\$331	\$188,932
Large (20-500)	19	\$878	\$16,680
Total	589		\$205,613

^a No. of operations opening or re-opening annually (from MSHA's PEIR special run data; see Table IV-9).

^b Annual cost per operator = $(W_s \times H_{s1}) + (W_c \times H_c) + (W_s \times H_{s2}) + (C \times N)$, where W_s is the hourly wage rate for supervisor (\$54.92 at coal operations; \$44.93 at M/NM operations); H_{s1} is the no. of hours for supervisor to develop training program [4 hr/small, 8 hr/large (20-500) coal and M/NM operations]; H_{s2} is the no. of hours for supervisor to prepare a lesson [2 hr/small and 4 hr/large (20-500)]; W_c is the hourly wage rate for a clerical worker (\$19.58 at coal operations; \$18.44 at M/NM operations); H_c is the no. of hours for clerical worker to prepare training program [2 hr/small and 4 hr/large(20-500)]; C is the cost of materials per miner (\$5/miner); and N is the average no. of miners per operation [5 for small coal, 66 for large (20-500) coal; and 5 small M/NM, 53 for large (20-500) M/NM (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors)].

Training records. Under the HazCom training subpart of the interim final rule, the operator was required to make a record of HazCom training and keep it for two years. That requirement has been removed from the HazCom final rule.

Compliance with the HazCom final rule will require that mine operators modify their part 46 and part 48 training plans, but

costs for modifying these plans have already been included as part of part 46 and part 48 compliance costs.

Summary of Annual Costs. Table IV-25 summarizes our estimate of the yearly cost for operators to comply with the HazCom training provisions of the final rule.

TABLE IV-25: Summary of Yearly Costs for Training Program

Provision	Coal			M/NM			Total Cost
	Small (< 20)	Large (20-500)	Large (> 500)	Small (< 20)	Large (20-500)	Large (> 500)	
Developing HazCom Training Program	\$59,948	\$24,763	\$152	\$159,540	\$38,841	\$166	\$283,410
Administering HazCom Training Program	\$214,098	\$88,439	\$544	\$569,787	\$138,718	\$593	\$1,012,179
Preparing HazCom Training	\$31,229	\$26,294	\$617	\$84,602	\$39,874	\$1,128	\$183,744
Initial HazCom Training to Miners	\$45,225	\$68,435	\$1,496	\$106,051	\$73,624	\$2,058	\$296,889
Initial HazCom Training to New Miners	\$6,727	\$13,755	\$309	\$45,301	\$43,839	\$1,274	\$111,206
Annual Initial HazCom Training for New Miners	\$5,790	\$15,785	\$531	\$49,981	\$64,492	\$2,812	\$139,392
HazCom Training for New Operations	\$89,365	\$77,917	\$0	\$188,932	\$16,680	\$0	\$372,895
Total	\$452,382	\$315,388	\$3,649	\$1,204,195	\$416,068	\$8,032	\$2,399,714

Source: Tables IV-18, IV-19, IV-20, IV-21, IV-22, , IV-23, and IV-24.

§ 47.62 HazCom training contents.

The compliance costs associated with this section are included in the cost estimates for § 47.61 of the final rule.

§ 47.63 HazCom training records.

The compliance costs associated with this section are included in the cost estimates for § 47.61 of the final rule.

§ 47.71 Access to HazCom materials.

This section of the final rule provides miners and designated representatives with the right to examine and obtain a copy of written HazCom information. This information includes the written HazCom program, written labeling information, the MSDSs, and any other written information required by subpart H of the final rule, with the exception of the identity of trade secret chemicals. The final rule also requires operators to provide access to this written HazCom information without cost for the first copy and without cost for a copy of any new information. If the operator has previously provided the miner or designated representative the requested information, then the operator may charge for providing additional copies of this same information.

The final rule also requires operators to provide customers, upon their request, with a copy of the labeling information and the MSDS for any chemical purchased from the mine.

Providing copies to miners. In the REA for the interim final rule, we estimated that 10 percent of miners would request copies of HazCom information. However, during the public hearings on the interim final rule, several mine operators commented that miners and designated representatives rarely request MSDSs or other

written HazCom information. In response to these comments, we have reduced our estimate of the percentage of miners or designated representatives who will request HazCom information to 2 percent.

We estimate that it will require a clerical worker about 0.2 hours (12 minutes) to copy and distribute requested written HazCom information and that the cost for materials will average \$0.60 per request (6 pages at \$0.10/page).

Table IV-26 summarizes our estimate of the annual cost for operators to provide copies of HazCom information to miners or designated representatives.

TABLE IV-26: Cost for Providing Copies of HazCom Information to Miners

Operation Size (no. of miners)	No. of Operators Not Now in Compliance with Access Requirements ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	3,589	\$ 0.45	\$1,621
Large (20-500)	1,099	\$ 6	\$6,550
Large (> 500)	7	\$ 49	\$318
Total	4,694		\$8,489
M/NM			
Small (< 20)	11,985	\$ 0.43	\$5,139
Large (20-500)	1,272	\$ 5	\$5,784
Large (> 500)	6	\$ 70	\$428
Total	13,263		\$11,350

^a No. of operators not now in compliance with access requirements = $[(M \times P_m) + (i \times P_c)]$, where M is the total number of mines in that size category (from Table IV-3); P_m is the percentage of mines not in compliance with access requirements [100% of small coal, 94.8% of large (20-500) coal, and 75% of large (>500) coal mines; 90.8% of small M/NM, 44.7% of large (20-500) M/NM, and 5% of large (>500) N/NM mines]; i is the number of independent contractors in that size category (from Table IV-4); and P_c is the percentage of independent contractors not in compliance with access requirements (100% of all coal; 100% of all M/NM) (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

^b Annual cost per operator = $[(W_c \times H_c) + C] \times (0.02 \times N)$, where W_c is the hourly wage rate for clerical (\$19.58 at coal operations; \$18.44 at M/NM operations); H_c is 0.2 hour/miner request; C is the cost to photocopy and distribute the information (\$0.60 per request); 0.02 is the proportion of miners annually requesting a copy of HazCom information; and N is the average no. of miners per operation [5 for small coal, 66 for large (20-500) coal, and 542 for large (>500) coal operations; 5 small M/NM, 53 for large M/NM (20-500), and 811 for large (>500) M/NM operations] (derived from MSHA Document: Compliance Rates by Mine Size and HazCom Provision for Mines and Contractors).

Providing copies to customers. For this final rule, based on our experience and research and in response to comments, we estimate that customers will request a copy of a chemical's

labeling information and MSDS about 12 times per year at a small coal operation, 24 times per year at a coal operation with 20-500 employees, 52 times per year at a coal operation with more than 500 employees, 24 times per year at a small M/NM operation, 52 times per year at a M/NM operation with 20-500 employees, and 104 times per year at a M/NM operation with more than 500 employees.⁵⁷ It will require a clerical worker about 0.2 hours (12 minutes) to copy and distribute the information, and the cost for materials will average about \$0.60 per request.

Table IV-27 summarizes our estimate of the annual cost for operators to provide customers with copies of the labeling information and the MSDS for a hazardous chemical they purchase from the mine.

⁵⁷ In the REA for the interim final rule, we estimated that customers would request a copy of a chemical's labeling information and MSDS about 12 times per year at a small mine, 24 times per year at a large coal mine, and 52 times per year at a large M/NM mine.

TABLE IV-27: Cost for Distribution of HazCom Labeling Information and MSDSs to Customers

Operation Size (no. of miners)	No. of Operators Not Now in Compliance with Access Requirements ^a	Annual Cost per Operator ^b	Total Annual Cost
Coal			
Small (< 20)	3,589	\$54	\$194,495
Large (20-500)	1,099	\$108	\$119,100
Large (> 500)	7	\$235	\$1,526
Total	4,694		\$315,121
M/NM			
Small (< 20)	11,985	\$103	\$1,233,355
Large (20-500)	1,272	\$223	\$283,728
Large (> 500)	6	\$446	\$2,743
Total	13,263		\$1,519,827

^a Number of operators not in compliance with access requirements (from Table IV-27).

^b Annual cost per operator = $[(W_c \times H_c) + C] \times R$, where W_c is the hourly wage rate for clerical worker (\$19.58 at coal mines, \$18.44 at M/NM mines); H_c is 0.2 hour to copy and distribute HazCom labeling information or MSDS; C is the cost of materials (\$0.60/HazCom information); and R is the average # number of times HazCom labeling information or MSDS distributed/year [12/small coal, 24/large (20-500) coal, and 52/large (>500) coal operations; 24/small M/NM, 52/large (20-500) M/NM, and 104 large (>500) M/NM operations].

Summary of Annual Costs. Table IV-28 summarizes our estimate of the annual cost for operators to provide HazCom information in response to miner, designated representative, or customer request, as required by the final rule.

TABLE IV-28: Summary of Annual Costs for Providing HazCom Information

Provision	Coal			M/NM			Total Cost
	Small (< 20)	Large (20-500)	Large (> 500)	Small (< 20)	Large (20-500)	Large (> 500)	
To Miners and Reps	\$1,621	\$6,550	\$318	\$5,139	\$5,784	\$428	\$19,840
To Customers	\$194,495	\$119,100	\$1,526	\$1,233,355	\$283,728	\$2,743	\$1,834,948
Total	\$196,116	\$125,650	\$1,845	\$1,238,494	\$289,512	\$3,170	\$1,854,788

Source: Tables IV-26 and IV-27.

§ 47.72 Cost for copies.

The annual compliance costs for this section are included in the cost estimates for § 47.71 of the final rule.

§ 47.73 Providing labels and MSDSs to customers.

The annual compliance costs for this section are included in the cost estimates for § 47.71 of the final rule.

Subpart I - Trade Secret Hazardous Chemical

Subpart I encompasses § 47.81 through § 47.87 of the final rule. We do not associate any compliance costs with these sections.

We note that § 47.87 (review of denial) of the final rule allows operators to protect the confidentiality of specific chemical identity information that is a bona fide trade secret. Nevertheless, the final rule requires the disclosure of the identity of trade secret hazardous chemicals to health

professionals, miners, and designated representatives who have an occupational health need for the information and can demonstrate that the information can be kept confidential. Because nearly all of these trade secrets will involve chemicals brought onto the mine site, a request for this information will require the operator to obtain the information from the chemical supplier.

Based on our analysis, however, we have concluded that there will be few requests for disclosure of trade secret information and that the associated first-year and annual costs will be negligible. Therefore, we have not calculated a compliance cost for this provision.

§ 47.91 Exemptions from the HazCom standard.

This section includes a listing of the chemicals and products which are exempted from the requirements of the final rule. We have associated no compliance costs with these exemptions.

§ 47.92 Exemptions from labeling.

This section includes a listing of the chemicals and products which are exempt from the labeling requirements of the final rule. We have associated no compliance costs with these exemptions.

FEASIBILITY

As discussed in the preamble of this final rule, we have concluded that the requirements of the final rule are both technologically and economically feasible.

Technological Feasibility

To demonstrate technological feasibility, an agency must show that modern technology has at least conceived some industrial strategies or devices that are likely to be capable of meeting the standard in question, and which industry is generally capable of adopting.

This final rule is not a technology-forcing standard and does not involve activities on the frontiers of scientific knowledge. Nor are there any apparent technological barriers preventing implementation of the requirements of the final rule since most of these requirements involve common business practices that are administrative in nature. In addition, the provisions of the final rule have been designed to be performance-oriented and informational, so as to maximize the opportunity for all operators to achieve compliance. Furthermore, mine operators in those states with employee right-to-know laws have already demonstrated an ability to comply with many requirements of the final rule. Similarly, businesses in other industries have been able to comply with OSHA's Hazard Communication Standard, which closely parallels

our own HazCom final rule. We conclude, therefore, that this final rule is technologically feasible.

Economic Feasibility

As previously estimated in this chapter, the mining industry will incur costs of approximately \$7.8 million yearly to comply with the final rule. That these compliance costs represent well less than 1 percent (about 0.01 percent) of mining industry yearly revenues of \$57.9 billion provides, we believe, convincing evidence that the final rule is economically feasible. We conclude, therefore, that the final rule is economically feasible for the mining industry.

V. REGULATORY FLEXIBILITY CERTIFICATION

INTRODUCTION

In accordance with section 605 of the Regulatory Flexibility Act (RFA), we certify that this final rule does not have a significant economic impact on a substantial number of small entities that are covered by this rulemaking. Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the RFA, we must include in the final rule a factual basis for this certification. We must also publish the regulatory flexibility certification statement in the Federal Register, along with the factual basis, followed by an opportunity for the public to comment.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a final rule on small entities, we must use the SBA definition for a small entity, or after consultation with the Small Business Administration (SBA) Office of Advocacy, establish an alternative definition for the mining industry after publishing that definition in the Federal Register for notice and comment. We have not taken such an action, and hence are required to use the SBA definition.

The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees (13 CFR 121.201). Almost all of the coal and M/NM mines affected by this rulemaking

fall into this category, and hence can be viewed as sharing the special regulatory concerns which the RFA was designed to address.

Traditionally, the Agency has also looked at the impacts of its rules on a subset of mines with 500 or fewer employees—those with fewer than 20 employees, which the mining community refers to as "small mines." These small mines differ from larger mines not only in the number of employees, but also, among other things, in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, their costs of complying with the final rule and its impact on them will also tend to be different. It is for this reason that "small mines," as traditionally defined by the mining community, are of special concern to us.

This analysis complies with the legal requirements of the RFA for an analysis of the economic impacts on "small entities" while continuing the Agency's traditional look at "small mines." We conclude that we can certify that the final HazCom rule will not have a significant economic impact on a substantial number of small entities that are covered by this rulemaking. We determined that this is the case both for mines with fewer than 20 employees and for mines with 500 or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach

Our analysis of economic impacts on "small entities" begins with a "screening" analysis. The screening compares the estimated compliance costs of a final rule for small entities in the sector covered by the rule to the estimated revenues for those small entities. When estimated compliance costs are less than 1 percent of the estimated revenues (for the size categories considered), we believe it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. When estimated compliance costs exceed 1 percent of revenues, it tends to indicate that further analysis may be warranted.

Derivation of Costs and Revenues

In this final rule, compliance costs must be absorbed by both coal and M/NM mines. We examined the relationship between costs and revenues for the coal and M/NM mine sectors as two independent entities, rather than combining them into one category.

The compliance costs noted in this chapter were previously presented in Chapter IV of this document along with an explanation of how they were derived. All underground and surface coal mines and underground and surface M/NM are potentially affected by the final HazCom rule.

In determining revenues for underground and surface coal mines, we multiplied mine production data (in tons) by the

estimated price per ton of the commodity (\$16.78 per ton in 2000). The production data were obtained from 2000 PEIR data, and the price estimates were obtained from the Department of Energy.⁵⁸ With respect to the M/NM industry, we took the total revenue generated by the M/NM industry (\$40.2 billion)⁵⁹ and divided it by the total number of employee hours to arrive at the average revenue per hour of employee production (\$70.45). We then took the \$70.45 and multiplied it by employee hours in specific size categories to arrive at estimated revenues. We used this approach to determine the estimated revenues for the M/NM mining industry because we do not collect data on M/NM production.

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 about 0.24 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 \$481 per mine operator, and estimated yearly costs as a percentage of revenues are approximately 0.02 percent.

⁵⁸ U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p. 206.

⁵⁹ U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2001, January 2001, p. 7.

TABLE V-1: The Impact of Final Rule on the Coal Mining Industry*
TABLE V-2: The Impact of Final Rule on the Coal Mining Industry*

Mine Type	Estimated Yearly Costs	Estimated Revenues	Estimated Cost per Operation	Costs as % of Revenues
()	436.	586. 06.		
Small (≤ 500)	\$ 2,273,156	\$ 15,093,130,897	\$ 481	0.02%
ge ()	845.	17,077. 39.		
Large (> 500)	\$ 8,730	\$ 2,570,515,615	\$ 1,091	0.00%

* Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 2000 PEIR data; and U.S. Department of Energy, Energy Information Administration, *Coal Industry Annual 2000*, January 2002, p 206.

As shown in Table V-3, for M/NM mines with fewer than 20 employees, the estimated yearly cost of the final rule is \$334 per mine operator, and estimated costs as a percentage of revenues are about 0.05 percent. As shown in Table V-4, for M/NM mine operators with 500 or fewer employees, the estimated yearly cost is \$361 per mine operator, and estimated costs as a percentage of revenues are about 0.01 percent.

TABLE V-3: The Impact of Final Rule on the M/NM Mining Industry*

Mine Type	Estimated Yearly Costs	Estimated Revenues	Estimated Cost per Operation	Costs as % of Revenues
Small (< 20)	\$ 4,303,493	\$ 8,377,359,945	\$ 334	0.05%
Large (> 20)	\$ 1,175,157	\$ 31,812,640,055	\$ 519	0.00%

* Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 2000 PEIR data; and U.S. Department of Interior, US Geological Survey, *Mineral Commodity Summaries 2001*, January 2001, p 7.

TABLE V-4: The Impact of Final Rule on the M/NM Mining Industry*

Mine Type	Estimated Yearly Costs	Estimated Revenues	Estimated Cost per Operation	Costs as % of Revenues
Small (\leq 500)	\$ 5,456,905	\$ 36,801,733,471	\$ 361	0.01%
Large ($>$ 500)	\$ 21,745	\$ 3,388,266,529	\$ 777	0.00%

* Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 2000 PEIR data; and U.S. Department of Interior, US Geological Survey, Mineral Commodity Summaries 2001, January 2001, p 7.

In all cases, the cost of complying with the final rule is less than 0.24 percent of revenues, well below the level suggesting that the final rule might have a significant economic impact on a substantial number of small entities. Accordingly, we have certified that there is no such impact on small coal mines or small M/NM mines.

As required under the law, we are complying with our obligation to consult with the Chief Counsel for Advocacy on this final rule, and on our certification of no significant economic impact on a substantial number of small entities covered by this final rule. Consistent with Agency practice, notes of any meetings with the Chief Counsel's office on this final rule, or any written communications, will be placed in the rulemaking record.

ALTERNATIVES CONSIDERED

In accordance with § 604 of the RFA, we are including a discussion of the regulatory alternatives considered in developing this final rule. In part, the limited impact of the final rule on small mines reflects our decision not to require more costly regulatory alternatives. At the same time, in considering regulatory alternatives for small mines, we had to observe the requirements of our 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.

We used OSHA's Hazard Communication Standard (HCS) as a model for our proposed HazCom rule. For the final rule, we considered regulatory alternatives suggested by commenters to the proposed and interim final rule. Most of those regulatory alternatives addressed the scope of the standard—what would be covered and what would be exempted. In response to comments, we did adopt several provisions that differ from the proposed rule or OSHA's HCS. The following discussion reviews the seven major regulatory alternatives considered.

1. The proposed rule would have exempted hazardous waste regulated by EPA under the Resource Conservation and Recovery Act from HazCom's labeling and MSDS requirements. The final rule is the same as the interim final rule and does not exempt hazardous

waste regulated by EPA from labeling and MSDS requirements. We determined that such an exemption would put miners at risk of potential injury and illness.

2. As proposed, the final rule exempts the raw materials mined or milled from the labeling requirements while on mine property. OSHA's HCS does not address raw material being mined or milled on mine property.

3. The proposed rule would have exempted from HazCom's labeling requirements certain hazardous substances regulated and labeled under the authority and standards of other federal agencies. These hazardous substances include cosmetics, drugs, tobacco products, foods, food additives, and color additives which are labeled in accordance with the requirements of the Food and Drug Administration or the Department of Agriculture. The interim final rule extended these exemptions to the full scope of the rule rather than to labeling only. The final rule retains these exemptions but simplifies the conditions for exemption for "items for personal consumption" when those items are labeled and packaged for retail sale and intended for personal consumption or use.

4. To be consistent with OSHA's HCS, we included in the final rule exemptions from labeling for hazardous substances that EPA or other federal agencies require to be labeled for hazards.

5. The proposed rule would have allowed operators not to label temporary, portable containers of a hazardous chemical that

was to be used only by the miner who transferred it from its labeled container. The final rule, consistent with the interim final rule, allows other miners to use the hazardous chemical from the unlabeled container if the operator ensures that all miners know the chemical's identity, its hazards, and protective measures; and that the operator ensure the container is left empty at the end of the shift. The final rule, however, also adds a new compliance alternative for labeling temporary, portable containers.

6. In the proposed rule, we would have required operators to label containers of their hazardous product or provide a copy of the labeling information with the first shipment to a customer who is an employer. The final rule does not automatically require operators to label their hazardous product for sale to customers who are employers. Rather, we require operators to provide the label or labeling information and an MSDS only when requested. This requirement in the final rule is the same as that in the interim final rule.

7. The final rule allows operators to credit relevant training provided for compliance with other MSHA standards, OSHA's HCS, or other federal or state training to meet HazCom's training requirements. It also requires the operator to record HazCom training.

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT

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.

For purposes of the Unfunded Mandates Reform Act of 1995, the final HazCom rule does not include any federal mandate that may result in increased expenditures by State, local, or tribal governments or increased expenditures by the private sector of more than \$100 million annually.

Based on the analysis conducted in Chapter IV of this Regulatory Economic Analysis, the coal and M/NM mining industries will incur compliance costs associated with this final rule of approximately \$7.8 million annually. There is no need for further analysis under § 202 of the Unfunded Mandates Reform Act.

The final rule will impact 1,900 coal mine operators, 2,837 coal contractors, 11,502 M/NM mine operators, and 3,644 M/NM contractors. With respect to the coal mining industry, we are not aware of any mine owned by state or local governments. Of the 11,502 M/NM mines and 3,644 M/NM contractors, there are 217 M/NM mines (about 1.4 percent) operated and/or owned by either a state

or local government. Of these 217 mines, almost all operate in states that have "right to know" laws affecting public employees and, therefore, they will not incur compliance costs as a result of this rulemaking. We do not believe that the mines which are operated and/or owned by either a state or local government will be adversely affected by this rulemaking. All but four of these mines employ fewer than 20 workers. The cost of the final rule on the average M/NM operator employing fewer than 20 workers is approximately \$334 annually. The cost of the final rule on the average M/NM operator employing 20 or more workers is approximately \$519 annually. In the long run, these modest compliance costs should be offset by a reduction in chemically related injuries and illnesses and associated operator costs.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 requires each federal agency to consider the environmental effects of proposed actions and to prepare an Environmental Impact Statement on major actions significantly affecting the quality of the environment. We have reviewed the final HazCom rule in accordance with NEPA requirements (42 U.S.C. 4321 *et. seq.*), the regulations of the Council of Environmental Quality (40 CFR Part 1500), and the Department of Labor's NEPA procedures (29 CFR Part 11). As a result of this review, we have determined that this final rule will have no significant environmental impact.

EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS

This final rule is not subject to Executive Order 12630, Government Actions and Interference with Constitutionally Protected Property Rights, because it does not involve implementation of a policy with takings implications.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The Agency has reviewed Executive Order 12988, Civil Justice Reform, and determined that the final HazCom rule will not unduly burden the federal court system. The final rule has been written so as to provide a clear legal standard for affected conduct and has been reviewed carefully to eliminate drafting errors and ambiguities.

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

In accordance with Executive Order 13045, we have evaluated the environmental health and safety effects of the final HazCom rule on children. We have determined that the final rule will not have an adverse impact on children.

EXECUTIVE ORDER 13132: FEDERALISM

We have reviewed the final HazCom rule in accordance with Executive Order 13132 regarding federalism and have determined that it does not have "federalism implications." The final rule

does not "have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

We certify that the final HazCom rule will not impose substantial direct compliance costs on Indian tribal governments.

EXECUTIVE ORDER 13211: ACTIONS CONCERNING REGULATIONS THAT SIGNIFICANTLY AFFECT ENERGY SUPPLY, DISTRIBUTION, OR USE

In accordance with Executive Order 13211, we have reviewed the final HazCom rule for its energy impacts. The rule has no effect on the distribution or use of energy. The only impacts of the rule on the supply of energy would be through its effect on the price of coal or the production of coal. Impacts of the rule on M/NM mines do not affect the supply of energy.

The final rule has no direct effects on the production of coal. The rule does not prevent the mining of particular coal deposits, nor does the rule require coal deposits to be mined at a slower pace. The only impacts of the rule on coal mine production are indirect, via the cost or price of coal.

The estimated annual cost of the final rule for the coal mining industry is approximately \$2.3 million.⁶⁰ The annual

⁶⁰ Estimate obtained from Table IV-1.

revenues of the coal mining industry in 2000 were approximately \$17.7 billion.⁶¹ The cost of the rule for the coal mining industry is therefore equal to approximately 0.013% of revenues. Even if we were to suppose that the increased cost caused by the rule would be fully reflected in coal prices, the impact would be negligible.

Accordingly, we have determined that the final HazCom rule has no significant adverse effect on the supply, distribution, or use of energy.

⁶¹ Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 2000 PEIR data; and U.S. Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, p.206.

VII. PAPERWORK REDUCTION ACT OF 1995

INTRODUCTION

The purpose of this chapter is to show the burden hours and related costs which would be borne by underground and surface coal and M/NM mine operators, including independent contractors, as a result of the final HazCom rule. The costs in this chapter are derived from Chapter IV of this REA. However, in this chapter, we estimate costs only in relation to the burden hours that the final rule imposes. Therefore, not all costs derived in Chapter IV appear below. Those costs derived in Chapter IV that do not have burden hours related to them do not appear in this chapter.

All 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.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

The final HazCom rule has first year burden hours (those that occur only in the first year) and annual burden hours (those that occur in the first year and every year thereafter). How we calculated the HazCom burden hours and costs, however, requires explanation. In most cases, the final HazCom rule imposes burden

hours and costs that will be the same every year, beginning with the first year that the rule goes into effect. These are "annual" burden hours and costs, as traditionally defined.

In a few cases, however, the final HazCom rule imposes burden hours and costs which will be the same each year starting in the second year, but whose first year burden hours and costs are different. We transformed these first year burden hours and costs and annual burden hours and costs starting in Year 2 into adjusted first year burden hours and costs (first year burden hours and costs minus an amount equal to annual burden hours and costs starting with Year 2 after the rule takes effect) and true annual burden hours and costs starting in Year 1 after the rule takes effect.⁶²

Coal Operations

First Year Burden Hours: During the first year the HazCom rule is in effect, coal operations will incur total burden hours of 172,285 and associated costs of \$6,993,307. Total burden hours consist of first year and annual burden hours. First year burden hours are 124,576 and their associated costs are equal to \$5,346,058, which is equivalent to \$374,224 of annualized costs

⁶² A hypothetical example might help to explain this procedure. Suppose that burden costs are \$2,000 the first year and \$400 each year thereafter. The adjustment procedure simply splits first year burden costs into two parts: (1) \$400, for the first year of annual burden costs; and (2) the residual \$1,600. Consequently, adjusted first year burden costs would be \$1,600 and annual burden costs (starting in year 1) would be \$400.

(from Table VII-1). Annual burden hours are 47,709 and their associated costs are \$1,647,249 (from Table VII-2).

Annual Burden Hours in Second Year and Every Year Thereafter:

In the second year that the HazCom rule goes into effect, and every year thereafter, total annual burden hours for coal operations will be 47,709, and the associated costs will be \$1,647,249 (from Table VII-2).

M/NM Operations

First Year Burden Hours: During the first year the HazCom rule is in effect, M/NM operations will incur total burden hours of 476,304 and associated costs of \$15,903,055. Total first year burden hours again consist of the same two components: first year burden hours and annual burden hours. There will be 329,281 burden hours in the first year with associated costs of \$11,948,203, which is equivalent to \$836,374 of annualized costs (from Table VII-3). Annual burden hours will be 147,023 with associated costs of \$3,954,852 (from Table VII-4).

Annual Burden Hours in Second Year and Every Year Thereafter:

In the second year that the HazCom rule is in effect, and every year thereafter, total annual burden hours for M/NM operations will be 147,023 and associated costs will be \$3,954,852 (from Table VII-4).

Table VII-1: First Year Paperwork Burden Hours and Costs to Coal Operations for HazCom Rule *

Paperwork Provisions	\$	Employ < 20			Employ 20 to 500			Employ >500			Total		
		Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs
Develop HazCom Program for Operations w/o Program ^a	47.31	37,233	\$ 1,610,626	\$ 112,744	18,986	\$ 821,307	\$ 57,492	67	\$ 2,907	\$ 203	56,287	\$ 2,434,840	\$ 170,439
Review Existing Program	47.31	258	\$ 11,156	\$ 781	2,831	\$ 122,448	\$ 8,571	154	\$ 6,644	\$ 465	3,242	\$ 140,248	\$ 9,817
MSDS Development ^a	47.51	9,063	\$ 392,043	\$ 27,443	4,581	\$ 198,170	\$ 13,872	10	\$ 443	\$ 31	13,654	\$ 590,656	\$ 41,346
Obtain MSDSs at Existing Operations with Internet Access	47.51	1,726	\$ 64,304	\$ 4,501	785	\$ 29,254	\$ 2,048	1.3	\$ 48	\$ 3	2,513	\$ 93,606	\$ 6,552
Obtain MSDSs at Existing Operations without Internet Access	47.51	10,358	\$ 323,596	\$ 22,652	1,047	\$ 32,714	\$ 2,290	0	\$ -	\$ -	11,405	\$ 356,310	\$ 24,942
Develop HazCom Training Program	47.61	19,851	\$ 858,732	\$ 60,111	8,200	\$ 354,722	\$ 24,831	50	\$ 2,180	\$ 153	28,102	\$ 1,215,634	\$ 85,094
Prepare for Initial HazCom Training Program	47.61	6,617	\$ 363,415	\$ 25,439	2,733	\$ 150,118	\$ 10,508	22	\$ 1,230	\$ 86	9,373	\$ 514,763	\$ 36,033
Total		85,107	\$ 3,623,871	\$ 253,671	39,164	\$ 1,708,734	\$ 119,611	305	\$ 13,453	\$ 942	124,576	\$ 5,346,058	\$ 374,224

* Source: Tables VII-5, VII-7, VII-10, VII-13a, VII-13b, VII-14a, VII-14b, VII-16, VII-18 .

^a Burden hours, first year costs, and annualized costs are adjusted (first year - annual).

Table VII-2: Annual Paperwork Burden Hours and Costs to Coal Operations for HazCom Rule*

Paperwork Provisions	§	Employ <20		Employ 20 to 500		Employ >500		Total	
		Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs
Update HazCom Program for Operators w/o Program	47.31	5,319	\$ 230,089	2,712	\$ 117,330	10	\$ 415	8,041	\$ 347,834
Develop HazCom Program for New Operations	47.31	2,724	\$ 117,834	1,752	\$ 75,788	0	\$ -	4,476	\$ 193,622
Cost to Label Containers	47.41	572	\$ 31,413	899	\$ 49,364	37	\$ 2,024	1,508	\$ 82,800
Updating MSDSs	47.51	1,295	\$ 56,006	654	\$ 28,310	1.5	\$ 63	1,951	\$ 84,379
Develop MSDSs for New Operators	47.51	681	\$ 29,459	438	\$ 18,947	0	\$ -	1,119	\$ 48,405
Maintaining MSDSs at Mines with Internet Access	47.51	432	\$ 8,450	196	\$ 3,844	0	\$ 6	628	\$ 12,301
Maintaining MSDSs at Mines without Internet Access	47.51	3,453	\$ 67,601	305	\$ 5,980	0	\$ -	3,758	\$ 73,581
Removing MSDSs	47.51	863	\$ 47,404	76	\$ 4,193	0	\$ -	939	\$ 51,597
Obtain MSDSs at New Operations with Internet Access	47.51	114	\$ 4,228	66	\$ 2,447	0	\$ -	179	\$ 6,675
Obtain MSDSs at New Operations without Internet Access	47.51	681	\$ 21,276	88	\$ 2,737	0	\$ -	769	\$ 24,013
Administer HazCom Training Program	47.61	4,963	\$ 214,683	2,050	\$ 88,681	13	\$ 545	7,026	\$ 303,909
Developing and Preparing HazCom Training for New Operations	47.61	1,816	\$ 83,690	1,168	\$ 53,827	0	\$ -	2,984	\$ 137,518
Provide Copies of HazCom Information to Miners	47.73	72	\$ 1,405	290	\$ 5,680	14	\$ 276	376	\$ 7,362
Provide Copies of HazCom Information to Customers	47.73	8,614	\$ 168,654	5,275	\$ 103,276	68	\$ 1,324	13,956	\$ 273,254
Total		31,597	\$ 1,082,193	15,970	\$ 560,403	143	\$ 4,654	47,709	\$ 1,647,249

* Source: Tables VII-6, VII-8, VII-9, VII-11, VII-12, VII-15a, VII-15b, VII-15c, VII-17, VII-19, VII-20, and VII-21.

Table VII-3: First Year Paperwork Burden Hours and Costs to M/NM Operations for HazCom Rule *

Paperwork Provisions	\$	Employ < 20			Employ >20 & <500			Employ >500			Total		
		Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs	Burden Hours	First Year Costs	Annualized Costs
Develop HazCom Program for Operations w/o Program ^a	47.31	132,826	\$ 4,806,754	\$ 336,473	34,180	\$ 1,236,926	\$ 86,585	202	\$ 7,296	\$ 511	167,208	\$ 6,050,975	\$ 423,568
Review Existing Program	47.31	1,379	\$ 49,915	\$ 3,494	7,324	\$ 265,058	\$ 18,554	557	\$ 20,150	\$ 1,410	9,261	\$ 335,123	\$ 23,459
MSDS Development ^a	47.51	16,705	\$ 604,521	\$ 42,316	7,504	\$ 271,565	\$ 19,010	57	\$ 2,080	\$ 146	24,267	\$ 878,167	\$ 61,472
Obtain MSDSs at Existing Operations with Internet Access	47.51	3,182	\$ 100,818	\$ 7,057	643	\$ 20,380	\$ 1,427	4	\$ 116	\$ 8	3,829	\$ 121,314	\$ 8,492
Obtain MSDSs at Existing Operations without Internet Access	47.51	19,091	\$ 518,934	\$ 36,325	858	\$ 23,312	\$ 1,632	0	\$ -	\$ -	19,949	\$ 542,245	\$ 37,957
Develop HazCom Training Program	47.61	63,134	\$ 2,284,723	\$ 159,931	15,370	\$ 556,228	\$ 38,936	66	\$ 2,378	\$ 166	78,570	\$ 2,843,328	\$ 199,033
Prepare for Initial HazCom Training Program	47.61	21,045	\$ 945,541	\$ 66,188	5,123	\$ 230,197	\$ 16,114	29	\$ 1,312	\$ 92	26,197	\$ 1,177,050	\$ 82,394
Total		257,363	\$ 9,311,206	\$ 651,784	71,004	\$ 2,603,667	\$ 182,257	914	\$ 33,331	\$ 2,333	329,281	\$ 11,948,203	\$ 836,374

* Source: Tables VII-5, VII-7, VII-10, VII-13a, VII-13b, VII-14a, VII-14b, VII-16, VII-18.

^a Burden hours, first year costs, and annualized costs are adjusted (first year - annual).

Table VII-4: Annual Paperwork Burden Hours and Costs to M/NM Mine Operators for HazCom Rule*

Paperwork Provisions	§	Employ <20		Employ 20 to 500		Employ >500		Total	
		Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs	Annual Burden Hours	Annual Costs
Develop HazCom Program for Operators w/o Program	47.31	18,975	\$ 686,679	4,883	\$ 176,704	29	\$ 1,042	23,887	\$ 864,425
Develop HazCom Program for New Operations	47.31	6,840	\$ 247,528	456	\$ 16,502	0	\$ -	7,296	\$ 264,030
Cost to Label Containers	47.41	1,669	\$ 75,010	1,427	\$ 64,131	156	\$ 7,011	3,253	\$ 146,151
Updating MSDSs	47.51	2,386	\$ 86,360	1,072	\$ 38,795	8	\$ 297	3,467	\$ 125,452
Develop MSDSs for New Operators	47.51	1,710	\$ 61,882	228	\$ 8,251	0	\$ -	1,938	\$ 70,133
Maintaining MSDSs at Mines with Internet Access	47.51	795	\$ 14,668	161	\$ 2,965	1	\$ 17	957	\$ 17,651
Maintaining MSDSs at Mines without Internet Access	47.51	6,364	\$ 117,348	250	\$ 4,613	0	\$ -	6,614	\$ 121,960
Removing MSDSs	47.51	1,591	\$ 71,481	63	\$ 2,810	0	\$ -	1,653	\$ 74,291
Obtain MSDSs at New Operations with Internet Access	47.51	285	\$ 9,030	17	\$ 542	0	\$ -	302	\$ 9,572
Obtain MSDSs at New Operations without Internet Access	47.51	1,710	\$ 46,481	23	\$ 620	0	\$ -	1,733	\$ 47,100
Administer HazCom Training Program	47.61	15,784	\$ 571,181	3,843	\$ 139,057	16	\$ 594	19,643	\$ 710,832
Developing and Preparing HazCom Training for New Operations	47.61	4,560	\$ 174,682	304	\$ 11,645	0	\$ -	4,864	\$ 186,328
Provide Copies of HazCom Labeling Information to Miners	47.73	240	\$ 4,420	270	\$ 4,974	20	\$ 368	529	\$ 9,762
Provide Copies of HazCom Labeling Information to Customers	47.73	57,526	\$ 1,060,778	13,234	\$ 244,028	128	\$ 2,359	70,887	\$ 1,307,164
Total		120,435	\$ 3,227,528	26,230	\$ 715,636	358	\$ 11,688	147,023	\$ 3,954,852

* Source: Tables VII-6, VII-8, VII-9, VII-11, VII-12, VII-15a, VII-17, VII-19, VII-20, and VII-21.

Section 47.31 Requirement for a HazCom Program.

Adjusted First Year Burden Hours and Costs For Operations Without a Written HazCom Program to Develop One

Operators who are currently without a written HazCom program are required to develop one under this provision.

During the first year that the rule goes in effect, 3,546 coal operations that employ fewer than 20 workers; 904 coal operations that employ 20 to 500 workers; and 2 coal operation that employs more than 500 workers will have to develop a written HazCom program. In addition, 12,650 M/NM operations that employ fewer than 20 workers; 1,628 M/NM operations that employ 20 to 500 workers; and 5 M/NM operations the employ more than 500 workers will also be affected.

We estimate that it will take an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's time to develop such a program for operations that employ fewer than 20 workers; an average of 16 hours of a supervisor's time and 8 hours of a clerical worker's time for operations that employ 20 to 500 workers; and an average of 32 hours of a supervisor's time and 16 hours of a clerical worker's time for operations that employ more than 500 workers.

The hourly wage rate is \$49.79 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-5 shows the adjusted first year burden hours and costs for operations without a HazCom program to develop one.

**Table VII-5: Section 47.31
Adjusted First Year Burden Hours and Costs For Operations
Without a Written HazCom Program to Develop One**

Adjusted First Year Burden Hours					
Operation Size	No. of Operations	Time to Develop Program ^a	First Year Burden Hours	Annual Burden Hours ^b	Adjusted First Year Burden Hours ^c
Coal					
Small (<20)	3,546	12	42,552	5,319	37,233
Large (20-500)	904	24	21,699	2,712	18,986
Large (> 500)	2	48	77	10	67
Total Coal	4,452		64,328	8,041	56,287
M/NM					
Small (<20)	12,650	12	151,801	18,975	132,826
Large (20-500)	1,628	24	39,063	4,883	34,180
Large (>500)	5	48	230	29	202
Total M/NM	14,283		191,095	23,887	167,208
Adjusted First Year Burden Costs					
Operation Size	Wage Rates ^d	First Year Burden Costs ^e	Annual Burden Costs ^f	Adjusted First Year Burden Costs ^g	Adjusted First Year Burden Costs Annualized ^h
Coal					
Small (<20)	\$43.26	\$1,840,715	\$230,089	\$1,610,626	\$112,744
Large (20-500)	\$43.26	\$938,637	\$117,330	\$821,307	\$57,492
Large (>500)	\$43.26	\$3,322	\$415	\$2,907	\$203
Total Coal		\$2,782,674	\$347,834	\$2,434,840	\$170,439
M/NM					
Small (<20)	\$36.19	\$5,493,433	\$686,679	\$4,806,754	\$336,473
Large (20-500)	\$36.19	\$1,413,630	\$176,704	\$1,236,926	\$86,585
Large (>500)	\$36.19	\$8,338	\$1,042	\$7,296	\$511
Total M/NM		\$6,915,400	\$864,425	\$6,050,975	\$423,568

- ^a For operations with <20 workers, 12 hrs. = (8 Superv. hrs. + 4 clerical hrs.).
For operations with 20 to 500 workers, 24 hrs. = (16 Superv. hrs. + 8 clerical hrs.).
For operations with >500 workers, 36 hrs. = (32 superv. hrs. + 16 clerical hrs.)
- ^b Equivalent amount of annual burden hours from Table VII-6.
- ^c First Year Burden Hours minus annual burden hours.
- ^d For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).
For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).
- ^e First year burden hours x wage rates.
- ^f Equivalent amount of annual burden costs from Table VII-6.
- ^g First Year Burden Costs minus annual burden Costs.
- ^h Adjusted first year burden costs x annualization factor of 0.07.

Section 47.31 Requirement for a HazCom Program. - Continued

Annual Burden Hours and Costs for Operations Without a Written to Update it Each Year

Under this provision, operators who are currently without a written HazCom program will need to update their program each year after having one in place in the first year.

There will be 3,546 coal operations that employ fewer than 20 workers; 904 coal operations that employ 20 to 500 workers; and 2 coal operations that employs more than 500 workers will have to update their HazCom program annually after the first year. In addition, 12,650 M/NM operations that employ fewer than 20 workers; 1,628 M/NM operations that employ 20 to 500 workers; and 5 M/NM operations that employ more than 500 workers will also be affected.

We estimate that it will take an average of 1 hour of a supervisor's time and 0.5 hours of a clerical worker's time to update such a program for operations that employ fewer than 20 workers; an average of 2 hours of a supervisor's time and 1 hour of a clerical worker's time for operations that employ 20 to 500 workers; and 4 hours of a supervisor's time and 2 hours of a clerical worker's time to update such a program for operations the employ more than 500 workers.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-6 shows annual burden hours and costs for operations currently without a HazCom program to update the program after the first year the rule goes into effect.

**Table VII-6: Section 47.31
Annual Burden Hours and Costs for Operations Without a Written HazCom Program to Update it Each Year, After the First Year**

Annual Burden Hours					
Operations Size	No. of Operations	Time to Update Program ^a	Total Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal					
Small (<20)	3,546	1.5	5,319	\$43.26	\$230,089
Large (20-500)	904	3	2,712	\$43.26	\$117,330
Large (>500)	2	6	10	\$43.26	\$415
Total Coal	4,452		8,041		\$347,834
M/NM					
Small (<20)	12,650	1.5	18,975	\$36.19	\$686,679
Large (20-500)	1,628	3	4,883	\$36.19	\$176,704
Large (>500)	5	6	29	\$36.19	\$1,042
Total M/NM	14,283		23,887		\$864,425

^a For operations with <20 workers, 1.5 hrs. = (1 Superv. hr. + 0.5 clerical hrs.)
 For operations with 20 to 500 workers, 3 hrs. = (2 Superv. hrs. + 1 clerical hr.)
 For operations with >500 workers, 6 hrs. = (4 Superv. hrs. + 2 clerical hr.)

^b Wage rates from Table VII-5.

Section 47.31 Requirement for a HazCom Program. - Continued

First Year Burden Hours and Costs For Operations With a HazCom Program to Review Their Existing Program

Operators who currently have a HazCom program will need to review their existing program for compliance with the final rule under this provision.

During the first year that the rule is in effect, 43 coal operations that employ fewer than 20 workers, 236 coal operations that employ 20 to 500 workers, and 6 coal operations that employ more than 500 workers will have to review their existing HazCom program. In addition, 230 M/NM operations that employ fewer than 20 workers, 610 M/NM operations that employ 20 to 500 workers, and 23 M/NM operations that employ more than 500 workers will also be affected.

We estimate that it will take an average of 4 hours of a supervisor's time and 2 hours of a clerical worker's time to review their existing HazCom program for operations employing fewer than 20 workers; an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's time for operations employing 20 to 500 workers; and an average of 16 hours of a supervisor's time and 8 hours of a clerical worker's time for operations employing more than 500 workers.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-7 shows the first year burden hours and costs for operations that currently have a HazCom program to review their existing program.

**Table VII-7: Section 47.31
First Year Burden Hours and Costs for Operations With a
HazCom Program to Review Their Existing Program**

First Year Burden Hours						
Operation Size	No. of Operations	Time to Review & Modify Program ^a	First Year Burden Hours	Wage Rates ^b	First Year Burden Costs	Annualized First Year Costs ^c
Coal						
Small (<20)	43	6	258	\$43.26	\$11,156	\$781
Large (20-500)	236	12	2,831	\$43.26	\$122,448	\$8,571
Large (>500)	6	24	154	\$43.26	\$6,644	\$465
Total Coal	285		3,242		\$140,248	\$9,817
M/NM						
Small (<20)	230	6	1,379	\$36.19	\$49,915	\$3,494
Large (20-500)	610	12	7,324	\$36.19	\$265,058	\$18,554
Large (>500)	23	24	557	\$36.19	\$20,150	\$1,410
Total M/NM	863		9,261		\$335,123	\$23,459

^a For operations with <20 workers, 6 hrs. = (4 Superv. hrs. + 2 clerical hrs.).
For operations with 20 to 500 workers, 12 hrs. = (8 Superv. hrs. + 4 clerical hrs.).
For operations with >500 workers, 24 hrs. = (16 Superv. hrs. + 8 clerical hrs.).

^b For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).
For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

^c First year burden costs x annualization factor of 0.07.

Section 47.31 Requirement for a HazCom Program. - Continued

Annual Burden Hours and Costs For New Operations to Develop a HazCom Program

All new mine operators will need to develop a HazCom program under this provision.

Each year that the rule is in effect, 227 new coal operations that employ fewer than 20 workers and 73 new coal operations that employ 20 to 500 workers will need to develop a HazCom program. In addition, 570 new M/NM operations that employ fewer than 20 workers and 19 new M/NM operations that employ 20 to 500 workers will be affected.

We estimate that it will take an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's time to develop a written HazCom program for operations employing fewer than 20 workers, and it will take an average of 16 hours of a supervisor's time and 8 hours of a clerical worker's time for operations employing 20 to 500 workers.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-8 shows the annual burden hours and costs for new operations to develop a HazCom program.

**Table VII-8: Section 47.31
Annual Burden Hours and Costs for New Operations
to Develop a HazCom Program**

Annual Burden Hours					
Operation Size	No. of New Operations	Time to Develop Program ^a	Total Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal					
Small (<20)	227	12	2,724	\$43.26	\$117,834
Large (20-500)	73	24	1,752	\$43.26	\$75,788
Total Coal	300		4,476		\$193,622
M/NM					
Small (<20)	570	12	6,840	\$36.19	\$247,528
Large (20-500)	19	24	456	\$36.19	\$16,502
Total M/NM	589		7,296		\$264,030

^a For operations with <20 workers, 12 hrs. = (8 Superv. hrs. + 4 clerical hrs.)

For operations with 20 to 500 workers, 24 hrs. = (16 Superv. hrs. + 8 clerical hrs.)

^b For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

Section 47.41 Requirement for container labels.

Annual Burden Hours and Costs to Label Containers

The operator must ensure that all containers of hazardous chemical are labeled.

Each year 1,430 coal operations that employ fewer than 20 workers, 247 coal operations that employ 20 to 500 workers, and 1 coal operations that employ more than 500 workers will need to label containers annually. In addition, 3,339 M/NM operations that employ fewer than 20 workers, 408 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations the employ more than 500 workers will also be affected.

For all operations in each size category, we estimate that it will take a supervisor 0.2 hours to verify or fill-out the label information and apply it to a container.

It is estimated that of 50% of containers at coal and M/NM operations employing fewer than 20 workers; 35% of containers at operations employing between 20 and 500 workers; and 25% of containers at operations employing more than 500 workers will need labeling. On average, there are 4 containers at a coal operation employing fewer than 20 workers; 52 containers at a coal operation employing 20 to 500 workers; and 567 containers at a coal operation employing more than 500 workers. At M/NM operations, there are about 5 containers at an operation employing fewer than 20 workers; 50 containers at an operation employing 20 to 500

workers; and 855 containers at an operation employing more than 500 workers.

The hourly wage rate for a health and safety personnel is \$54.92 at coal operations, and \$44.93 at M/NM operations.

Table VII-9 shows the annual burden hours and costs to label containers.

**Table VII-9: Section 47.41
Annual Burden Hours and Costs to Label Containers**

Annual Burden Hours						
Operation Size	No. of Operations	Time to Label Containers ^a	No. of Containers to Label per mine ^b	Total Annual Burden Hours	Wage Rates	Annual Burden Costs
Coal						
Small (<20)	1,430	0.2	2	572	\$54.92	\$31,413
Large (20-500)	247	0.2	18	899	\$54.92	\$49,364
Large (>500)	1	0.2	142	37	\$54.92	\$2,024
Total Coal	1,678			1,508		\$82,800
M/NM						
Small (<20)	3,339	0.2	3	1,669	\$44.93	\$75,010
Large (20-500)	408	0.2	18	1,427	\$44.93	\$64,131
Large (>500)	4	0.2	214	156	\$44.93	\$7,011
Total M/NM	3,750			3,253		\$146,151

^a For all operations, 0.2 hrs. to verify or fill-out lable information and apply it to a container.

^b For coal operations employing fewer than 20 workers, 2 = (4 containers x 50%).

50% is the percentage of containers that need new labels annually

For coal operations employing 20 to 500 workers, 18.2 = (52 containers x 35%).

35% is the percentage of containers that need new labels annually

For coal operations employing more than 500 workers, 141.75 = (567 containers x 25%).

25% is the percentage of containers that need new labels annually

For M/NM operations employing fewer than 20 workers, 2.5 = (5 containers x 50%).

50% is the percentage of containers that need new labels annually

For M/NM operations employing 20 to 500 workers, 17.5 = (50 containers x 35%).

35% is the percentage of containers that need new labels annually

For M/NM operations employing more than 500 workers, 213.75 = (855 containers x 25%).

25% is the percentage of containers that need new labels annually

Section 47.51 Requirement for an MSDS.

**Adjusted First Year Burden Hours and Costs for MSDS
Development of New Chemicals Produced at Existing Operations**

Mine operators must develop an MSDS for each hazardous chemical which they produce or use.

During the first year that the rule is in effect, 3,453 coal operations that employ fewer than 20 workers, 873 coal operations that employ 20 to 500 workers, and 1 coal operations that employ more than 500 workers will have to develop MSDSs for the chemicals they produce or use at the mine. In addition, 6,364 M/NM operations that employ fewer than 20 workers, 715 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will also have to develop MSDSs.

In the first year, we estimate that it will take an average of 2 hours of a supervisor's time to develop and 1 hour of a clerical worker's time to prepare an MSDS.

On average, the number of chemicals produced are as follows: 1 chemical for either a coal or M/NM operation employing fewer than 20 workers; 2 chemicals for a coal operation employing 20 to 500 workers; 4 chemicals for a M/NM operation employing 20 to 500 workers; 3 chemicals for a coal operation employing more than 500 workers; and 6 chemicals for a M/NM operation employing more than 500 workers.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage

rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-10 shows the adjusted first year burden hours and costs for developing MSDSs.

**Table VII-10: Section 47.51
Adjusted First Year Burden Hours and Costs For
Developing Material Safety Data Sheets**

Adjusted First Year Burden Hours						
Operation Size	No. of Operations	Time to Develop an MSDS ^a	No. of MSDS Developed per Mine	First Year Burden Hours	Annual Burden Hours ^b	Adjusted First Year Burden Hours ^c
Coal						
Small (<20)	3,453	3	1	10,358	1,295	9,063
Large (20-500)	873	3	2	5,236	654	4,581
Large (>500)	1	3	3	12	1.5	10
Total Coal	4,326			15,605	1,951	13,654
M/NM						
Small (<20)	6,364	3	1	19,091	2,386	16,705
Large (20-500)	715	3	4	8,576	1,072	7,504
Large (>500)	4	3	6	66	8	57
Total M/NM	7,082			27,733	3,467	24,267
Adjusted First Year Burden Costs						
Operation Size		Wage Rates ^d	First Year Burden Costs ^e	Annual Burden Costs ^f	Adjusted First Year Burden Costs ^g	Adjusted First Year Burden Costs Annualized ^h
Coal						
Small (<20)		\$43.26	\$448,050	\$56,006	\$392,043	\$27,443
Large (20-500)		\$43.26	\$226,480	\$28,310	\$198,170	\$13,872
Large (>500)		\$43.26	\$506	\$63	\$443	\$31
Total Coal			\$675,035	\$84,379	\$590,656	\$41,346
M/NM						
Small (<20)		\$36.19	\$690,881	\$86,360	\$604,521	\$42,316
Large (20-500)		\$36.19	\$310,360	\$38,795	\$271,565	\$19,010
Large (>500)		\$36.19	\$2,378	\$297	\$2,080	\$146
Total M/NM			\$1,003,619	\$125,452	\$878,167	\$61,472

^a For all operations, 3 hrs. = (2 Superv. hrs. + 1 clerical hr.).

^b Equivalent amount of annual burden hours from Table VII-11.

^c First Year Burden Hours minus annual burden hours.

^d For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

^e First year burden hours x wage rates.

^f Equivalent amount of annual burden costs from Table VII-11.

^g First Year Burden Costs minus annual burden Costs.

^h Adjusted first year burden costs x annualization factor of 0.07.

Section 47.51 Requirement for an MSDS - Continued

Annual Burden Hours and Costs for MSDS Development of New Chemicals Produced at Existing Operations

Under this provision, mine operators have to update MSDS information each year.

After the first year the rule goes into effect, 3,453 coal operations that employ fewer than 20 workers, 873 coal operations that employ 20 to 500 workers, and 1 coal operations the employ more than 500 workers will need to update MSDSs annually. In addition, 6,364 M/NM operations that employ fewer than 20 workers, 715 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will also be affected.

We estimate that it will take an average of 1 hour of a supervisor's time and 0.5 hours of a clerical worker's time to update an MSDS.

The number of MSDSs that will need to be update annually is 25 percent of those that were initially developed. Thus, 0.25 MSDSs (1 MSDS x 0.25) for either a coal or M/NM operation employing fewer than 20 workers; 0.5 MSDSs (2 MSDSs x 0.25) for a coal operation employing 20 to 500 workers; 1 MSDS (4 MSDSs x 0.25) for a M/NM operation employing 20 to 500 workers; 0.75 MSDSs (3 MSDSs x 0.25) for a coal operation employing more than 500 workers and 1.5 MSDSs (6 MSDSs x 0.25) for a M/NM operation employing more than 500 workers.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-11 shows the annual burden hours and costs for updating MSDSs.

**Table VII-11: Section 47.51
Annual Burden Hours and Costs for
Updating Material Safety Data Sheets**

Annual Burden Hours						
Operation Size	No. of Operations	Time to Update MSDS ^a	No. of MSDS to Update per Mine ^b	Total Annual Burden Hours	Wage Rates ^c	Annual Burden Costs
Coal						
Small (<20)	3,453	1.5	0.25	1,295	\$43.26	\$56,006
Large (20-500)	873	1.5	0.5	654	\$43.26	\$28,310
Large (>500)	1	1.5	0.75	1.5	\$43.26	\$63
Total Coal	4,326			1,951		\$84,379
M/NM						
Small (<20)	6,364	1.5	0.25	2,386	\$36.19	\$86,360
Large (20-500)	715	1.5	1	1,072	\$36.19	\$38,795
Large (>500)	4	1.5	1.5	8	\$36.19	\$297
Total M/NM	7,082			3,467		\$125,452

^a For all operation 1.5 hrs. = (1 Superv. hr. + 0.5 clerical hrs.)

^b For each operation size, 25% of MSDS developed in Table VII-10, will be updated annually.

^c For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

Section 47.51 Requirement for an MSDS - Continued

Annual Burden Hours and Costs for MSDS Development of Chemicals Produced at New Mines

All new mine operators must create an MSDS for each hazardous chemical produced at their mine site.

We estimate that each year 227 coal mines employing fewer than 20 workers, 73 coal mines employing between 20 and 500 workers, 570 M/NM mines employing fewer than 20 workers, and 19 M/NM mines employing between 20 and 500 workers will open annually.

On average, it will take a supervisor 2 hours to develop an MSDS and a clerical worker 1 hour to prepare it. On average, there will be 1 chemical created at each new small coal and M/NM mine; 2 chemicals for each new coal mine employing 20-500 workers; and 4 chemicals for each new M/NM mine employing 20-500 workers annually.

The hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker at coal mine operations. The hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker at M/NM operations.

Table VII-12 shows the annual burden hours and costs for MSDS development of chemicals produced at new mines.

**Table VII-12: Section 47.51
Annual Burden Hours and Costs for MSDS Development of Chemicals
Produced at New Mines**

Annual Burden Hours						
Operation Size	No. of New Operations	Time to Develop MSDS ^a	No. of MSDSs Developed per Mine	Total Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal						
Small (<20)	227	3	1	681	\$43.26	\$29,459
Large (20-500)	73	3	2	438	\$43.26	\$18,947
Total Coal	300			1,119		\$48,405
M/NM						
Small (<20)	570	3	1	1,710	\$36.19	\$61,882
Large (20-500)	19	3	4	228	\$36.19	\$8,251
Total M/NM	589			1,938		\$70,133

^a For all operations, 3 hrs. = (2 Superv. hrs. + 1 clerical hr.).

^b For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

Section 47.51 Requirement for an MSDS - Continued

First Year Burden Hours and Costs to Obtain MSDSs for Existing Operators and Annual Burden Hours and Annual Costs to Obtain MSDSs for New Mines

This provision requires mine operators to have copies of MSDSs for all hazardous chemicals present at the mine. Since there is no existing standard to require mine operators to retain MSDSs, not all operators keep copies of MSDSs supplied by manufacturers, suppliers, or distributors.

For coal operations the hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker. For M/NM operations the hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker.

Existing Operators:

We estimate that 1,727 small coal operators, 785 coal operators employing 20-500 workers, 1 large coal operator employing more than 500 workers, 3,182 small M/NM operators, 644 M/NM operators employing 20-500 employees, and 4 M/NM operations with more than 500 workers will need to obtain MSDSs in the first year and have internet access.

It will take about 30 minutes for a supervisor and another 30 minutes for a clerical worker to establish access to an MSDS database at each of these operations with internet access.

Table VII-13a shows burden hours and associated costs for mine operators with internet access to obtain access to an MSDS database.

**Table VII-13a: Section 47.51
First Year Burden Hours and Costs to Obtain MSDSs
at Existing Operations with Internet Access**

First Year Burden Hours						
Operation Size	No. of Operations	Time to Obtain MSDS ^a	First Year Burden Hours	Wage Rates ^b	First Year Burden Costs	Annualized First Year Costs ^c
Coal						
Small (<20)	1,726	1	1,726	\$37.25	\$64,304	\$4,501
Large (20-500)	785	1	785	\$37.25	\$29,254	\$2,048
Large (>500)	1	1	1.3	\$37.25	\$48	\$3
Total Coal	2,513		2,513		\$93,606	\$6,552
M/NM						
Small (<20)	3,182	1	3,182	\$31.69	\$100,818	\$7,057
Large (20-500)	643	1	643	\$31.69	\$20,380	\$1,427
Large (>500)	4	1	3.7	\$31.69	\$116	\$8
Total M/NM	3,829		3,829		\$121,314	\$8,492

^a For all operations, 1 hr. = (0.5 Superv. hrs. + 0.5 clerical hrs.).

^b For coal operations, \$37.25 = (0.5 x \$54.92) + (0.5 x \$19.58).

For M/NM operations, \$31.69 = (0.5 x \$44.93) + (0.5 x \$18.44).

^c First year burden costs x annualization factor of 0.07.

In addition, we estimate that 1,726 small coal operators, 87 coal operators with 20-500 workers, 3,182 small M/NM operators, and 71 M/NM operators with 20-500 employees will need to obtain MSDSs in the first year that do not have internet access.

For small coal and M/NM operators without internet access, it will take a supervisor 2 hours and a clerical work another 4 hours to obtain and assemble MSDSs. For coal and M/NM operators employing 20-500 workers without internet access, it will take a supervisor 4 hours and a clerical worker another 8 hours to obtain and assemble MSDSs.

Table VII-13b shows burden hours and associated costs for operators without internet access to obtain MSDSs.

**Table VII-13b: Section 47.51
First Year Burden Hours and Costs to Obtain MSDSs
at Existing Operations without Internet Access**

First Year Burden Hours						
Operation Size	No. of Operations	Time to Obtain MSDS ^a	First Year Burden Hours	Wage Rates ^b	Annual Burden Costs	Annualized First Year Costs ^c
Coal						
Small (<20)	1,726	6	10,358	\$31.24	\$323,596	\$22,652
Large (20-500)	87	12	1,047	\$31.24	\$32,714	\$2,290
Total Coal	1,814		11,405		\$356,310	\$24,942
M/NM						
Small (<20)	3,182	6	19,091	\$27.18	\$518,934	\$36,325
Large (20-500)	71	12	858	\$27.18	\$23,312	\$1,632
Total M/NM	3,253		19,949		\$542,245	\$37,957

^a For small operations, 6 hrs. = (2 Superv. hrs. + 4 clerical hrs.).

For large operations, 12 hrs. = (4 Superv. hrs. + 8 clerical hrs.).

^b For coal operations, \$31.24 = (0.33 x \$54.92) + (0.67 x \$19.58).

For M/NM operations, \$27.18 = (0.33 x \$44.93) + (0.67 x \$18.44).

^c First year burden costs x annualization factor of 0.07.

New Mines:

We estimate that 114 small new coal mines, 66 new coal mines employing 20-500 employees, 285 small new M/NM mines, and 17 new M/NM mines employing 20-500 employees will have internet access and will need to obtain MSDSs annually.

It will take about 30 minutes for a supervisor and another 30 minutes for a clerical worker to establish access to an MSDS database at each of these new mines with internet access.

Table VII-14a shows burden hours and associated costs for new mines with internet access to obtain access to an MSDS database.

**Table VII-14a: Section 47.51
Annual Burden Hours and Costs to Obtain MSDSs
for New Mines with Internet Access**

Annual Burden Hours					
Operation Size	No. of New Operations	Time to Obtain MSDS ^a	Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal					
Small (<20)	114	1	114	\$37.25	\$4,228
Large (20-500)	66	1	66	\$37.25	\$2,447
Total Coal	179		179		\$6,675
M/NM					
Small (<20)	285	1	285	\$31.69	\$9,030
Large (20-500)	17	1	17	\$31.69	\$542
Total M/NM	302		302		\$9,572

^a For all operations, 1 hrs. = (0.5 Superv. hrs. + 0.5 clerical hrs.).

^b For coal operations, \$37.25 = (0.5 x \$54.92) + (0.5 x \$19.58).

For M/NM operations, \$31.69 = (0.5 x \$44.93) + (0.5 x \$18.44).

In addition, we estimate that 114 small new coal mines, 7 new coal mines with 20-500 employees, 285 small new M/NM mines, and 2 new M/NM mines with 20-500 employees will not have internet access and will need to obtain MSDSs annually.

For small new coal and M/NM mines without internet access, it will take a supervisor 2 hours and a clerical work another 4 hours to obtain and assemble MSDSs. For new coal and M/NM mines with 20-500 workers without internet access, it will take a supervisor 4 hours and a clerical worker another 8 hours to obtain and assemble MSDSs.

Table VII-14b shows burden hours and associated costs for mine operators without internet access to obtain MSDSs.

**Table VII-14b: Section 47.51
Annual Burden Hours and Costs to Obtain MSDSs
for New Mines without Internet Access**

Annual Burden Hours					
Operation Size	No. of New Operations	Time to Obtain MSDS ^a	Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal					
Small (<20)	114	6	681	\$31.24	\$21,276
Large (20-500)	7	12	88	\$31.24	\$2,737
Total Coal	121		769		\$24,013
M/NM					
Small (<20)	285	6	1,710	\$27.18	\$46,481
Large (20-500)	2	12	23	\$27.18	\$620
Total M/NM	287		1,733		\$47,100

^a For small operations, 6 hrs. = (2 Superv. hrs. + 4 clerical hrs.).

For large operations, 12 hrs. = (4 Superv. hrs. + 8 clerical hrs.).

^b For coal operations, \$31.24 = (0.33 x \$54.92) + (0.67 x \$19.58).

For M/NM operations, \$27.18 = (0.33 x \$44.93) + (0.67 x \$18.44).

Section 47.51 Requirement for an MSDS - Continued

Annual Burden Hours and Costs for MSDS Maintenance

Under this provision, mine operators are required to maintain MSDSs, and under Section 47.55, operators must notify miners at least 3 months before disposing of an MSDS (but must retain the MSDS for a hazardous chemical as long as the hazardous chemical is at the mine).

Each year, 1,726 coal operations that employ fewer than 20 workers, 785 coal operations that employ 20 to 500 workers, and 1 coal operation that employs more than 500 workers will need to maintain MSDSs and will have internet access. In addition, 3,182 M/NM operations that employ fewer than 20 workers, 643 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will have internet access and will also be affected.

For all operations with internet access in all mine size categories, we estimate that it will take a clerical worker about 15 minutes (0.25 hours) annually to maintain MSDSs. The hourly wage rate is \$19.58 for a clerical worker at a coal operation and \$18.44 for a clerical worker at a M/NM operation.

Table VII-15a shows the annual burden hours and costs for mine operators with internet access to maintain MSDSs.

**Table VII-15a: Section 47.51
Annual Burden Hours and Costs for Maintaining MSDSs
at Mines with Internet Access**

Annual Burden Hours					
Operation Size	No. of Operations	Time to Maintain MSDSs ^a	Total Annual Burden Hours	Wage Rates	Annual Burden Costs
Coal					
Small (<20)	1,726	0.25	432	\$19.58	\$8,450
Large (20-500)	785	0.25	196	\$19.58	\$3,844
Large (>500)	1	0.25	0.3	\$19.58	\$6
Total Coal	2,513		628		\$12,301
M/NM					
Small (<20)	3,182	0.25	795	\$18.44	\$14,668
Large (20-500)	643	0.25	161	\$18.44	\$2,965
Large (>500)	4	0.25	1	\$18.44	\$17
Total M/NM	3,829		957		\$17,651

^a For all operations, it takes 0.25 hrs. for clerical worker to maintain MSDSs.

Every year, 1,726 coal operations that employ fewer than 20 workers, 87 coal operations that employ 20 to 500 workers, 3,182 M/NM operations that employ fewer than 20 workers, and 71 M/NM operations that employ 20 to 500 workers will need to maintain MSDSs and will not have internet access.

For all operations without internet access in all mine size categories, we estimate that it will take a clerical worker about 3 minutes (0.05 hours) to maintain an MSDS. On average, we estimate there will be 40 MSDSs per coal or M/NM operation that employs fewer than 20 workers and 70 MSDSs per coal or M/NM operation that employs 20 to 500 workers. The hourly wage rate is \$19.58 for a clerical worker at a coal operation and \$18.44 for a clerical worker at a M/NM operation.

Table VII-15b shows the annual burden hours and costs for maintaining MSDSs at operations without internet access.

**Table VII-15b: Section 47.51
Annual Burden Hours and Costs for Maintaining MSDSs
at Mines without Internet Access**

Annual Burden Hours						
Operation Size	No. of Operations	Time for Clerical to maintain an MSDS ^a	Average # of MSDSs per Mine	Total Annual Burden Hours	Wage Rates	Annual Burden Costs
Coal						
Small (<20)	1,726	0.05	40	3,453	\$19.58	\$67,601
Large (20-500)	87	0.05	70	305	\$19.58	\$5,980
Total Coal	1,814			3,758		\$73,581
M/NM						
Small (<20)	3,182	0.05	40	6,364	\$18.44	\$117,348
Large (20-500)	71	0.05	70	250	\$18.44	\$4,613
Total M/NM	3,253			6,614		\$121,960

^a For all operations, it takes 3 minutes (0.05 hrs.) for clerical worker to maintain an MSDS.

Operators must notify miners before disposing of an MSDS. We assume that only operators without internet access will remove MSDSs. (Operations with internet access will simply retain all the MSDSs in their electronic database.)

Each year, 1,726 coal operations that employ fewer than 20 workers, 87 coal operations that employ 20 to 500 workers, 3,182 M/NM operations that employ fewer than 20 workers, and 71 M/NM operations that employ 20 to 500 workers, all without internet access, will prepare MSDS removal announcements.

For all operations without internet access in all mine size categories, we estimate that it will take a supervisor about 3 minutes (0.05 hours) to prepare an MSDS removal announcement. On

average, we assume that a coal or M/NM operator employing fewer than 20 workers will remove 10 MSDSs annually. We assume that, on average, a coal or M/NM operator employing between 20 and 500 workers will remove about 17.5 MSDSs annually. The hourly wage rate for a supervisor at a coal mine operation is \$54.92 or \$44.93 at a M/NM mine operation.

Table VII-15c shows the annual burden hours and costs associated with operator removal of MSDSs.

**Table VII-15c: Section 47.51
Annual Burden Hours and Costs for Removing MSDSs
at Mines without Internet Access**

Annual Burden Hours						
Operation Size	No. of Operations	Time to Prepare MSDS Removal ^a	Average # of MSDSs Removed	Total Annual Burden Hours	Wage Rates	Annual Burden Costs
Coal						
Small (<20)	1,726	0.05	10	863	\$54.92	\$47,404
Large (20-500)	87	0.05	18	76	\$54.92	\$4,193
Total Coal	1,814			939		\$51,597
M/NM						
Small (<20)	3,182	0.05	10	1,591	\$44.93	\$71,481
Large (20-500)	71	0.05	18	63	\$44.93	\$2,810
Total M/NM	3,253			1,653		\$74,291

^a For all operations, it takes 3 minutes (0.05 hrs.) for supervisor to prepare MSDS removal announcement.

Section 47.61 Requirement for HazCom Training.

First Year Burden Hours and Costs to Develop a HazCom Training Program

Operators who do not have a HazCom training program must develop one in the first year.

During the first year that the rule is in effect, 3,309 coal operations that employ fewer than 20 workers, 683 coal operations that employ 20 to 500 workers, and 3 coal operations that employ more than 500 workers will have to develop a HazCom training program. In addition, 10,522 M/NM operations that employ fewer than 20 workers, 1,281 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will also have to develop a training program.

To develop the HazCom training program, we estimate that it will take an average of 4 hours of supervisor's time and 2 hours of a clerical worker's time for operations employing fewer than 20 workers; an average of 8 hours of a supervisor's time and 4 hours of a clerical worker's time for operations employing 20 to 500 workers; and an average of 12 hours of a supervisor's time and 6 hours of a clerical worker's time for operations employing more than 500 workers.

For coal operations the hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker. For M/NM operations the hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker.

Table VII-16 shows the first year burden hours and costs for operators without a HazCom training program to develop one.

**Table VII-16: Section 47.61
First Year Burden Hours and Costs for Operations
to Develop HazCom Training Program**

First Year Burden Hours						
Operation Size	No. of Operations	Develop Training Program ^a	First Year Burden Hours	Wage Rates ^b	First Year Burden Costs	First Year Burden Costs Annualized ^c
Coal						
Small (<20)	3,309	6	19,851	\$43.26	\$858,732	\$60,111
Large (20-500)	683	12	8,200	\$43.26	\$354,722	\$24,831
Large (>500)	3	18	50	\$43.26	\$2,180	\$153
Total Coal	3,995		28,102		\$1,215,634	\$85,094
M/NM						
Small (<20)	10,522	6	63,134	\$36.19	\$2,284,723	\$159,931
Large (20-500)	1,281	12	15,370	\$36.19	\$556,228	\$38,936
Large (>500)	4	18	66	\$36.19	\$2,378	\$166
Total M/NM	11,807		78,570		\$2,843,328	\$199,033

^a For operations with <20 workers, 6 hrs. = (4 Superv. hrs. + 2 clerical hrs.)

For operations with 20 to 500 workers, 12 hrs. = (8 Superv. hrs. + 4 clerical hrs.)

For operations with more than 500 workers, 18 hrs. = (12 Superv. hrs. + 6 clerical hrs.)

^b For coal operations, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM operations, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

^c Annualized first year costs = first year burden cost x 0.07 annualization factor.

Section 47.61 Requirement for HazCom Training - Continued

Annual Burden Hours and Costs to Administer HazCom Training Program

Mine operators need time to manage and administer the HazCom training program each year.

Each year, 3,309 coal operations that employ fewer than 20 workers, 683 coal operations that employ 20 to 500 workers, and 3 coal operations that employ more than 500 workers will need to administer a HazCom training program. In addition, 10,522 M/NM operations that employ fewer than 20 workers, 1,281 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will also be affected.

We estimate that it will take an average of 1 hour of a supervisor's time and 0.5 hours of a clerical worker's time to administer the training program for operations employing fewer than 20 workers; an average of 2 hours of a supervisor's time and 1 hour of a clerical worker's time for operations employing 20 to 500 workers; and an average of 3 hours of a supervisor's time and 1.5 hours of a clerical worker's time for operations employing more than 500 workers.

For coal operations, the hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker. For M/NM operations, the hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker.

Table VII-17 shows the annual burden hours and costs to administer a HazCom training program.

**Table VII-17: Section 47.61
Annual Burden Hours and Costs
to Administer the HazCom Training Program**

Annual Burden Hours					
Operation Size	No. of Operations	Time to Administer Training Program ^a	Total Annual Burden Hours	Wage Rates ^b	Annual Burden Costs
Coal					
Small (<20)	3,309	1.5	4,963	\$43.26	\$214,683
Large (20-500)	683	3	2,050	\$43.26	\$88,681
Large (>500)	3	4.5	13	\$43.26	\$545
Total Coal	3,995		7,026		\$303,909
M/NM					
Small (<20)	10,522	1.5	15,784	\$36.19	\$571,181
Large (20-500)	1,281	3	3,843	\$36.19	\$139,057
Large (>500)	4	4.5	16	\$36.19	\$594
Total M/NM	11,807		19,643		\$710,832

^a For operations employing fewer than 20 workers, 1.5 hrs. = (1 Superv. hr. + 0.5 clerical hrs.).

For operations employing 20 to 500 workers, 3 hrs. = (2 Superv. hrs. + 1 clerical hr.).

For operations employing more than 500 workers, 4.5 hrs. = (3 Superv. hrs. + 1.5 clerical hrs.).

^b For Coal, \$43.26 = (0.67 x \$54.92) + (0.33 x \$19.58).

For M/NM, \$36.19 = (0.67 x \$44.93) + (0.33 x \$18.44).

Section 47.61 Requirement for HazCom Training - Continued

First Year Burden Hours and Costs for Operators to Prepare Materials for Initial HazCom Training

Mine operators without a HazCom training program need time to prepare lesson materials for initial HazCom training.

In the first year that the rule goes into effect, 3,309 coal operations that employ fewer than 20 workers, 683 coal operations that employ 20 to 500 workers, and 3 coal operations that employ more than 500 workers will need to prepare lesson materials for the initial HazCom training program. In addition, 10,522 M/NM operations that employ fewer than 20 workers, 1,281 M/NM operations that employ 20 to 500 workers, and 4 M/NM operations that employ more than 500 workers will also be affected.

We estimate that it will take a supervisor about 2 hours in operations employing fewer than 20 workers, 4 hours in operations employing 20 to 500 workers, and 8 hours in operations employing more than 500 workers to prepare lesson materials for HazCom training.

For coal operations the hourly wage rate is \$54.92 for a supervisor. For M/NM operations the hourly wage rate is \$44.93 for a supervisor.

Table VII-18 shows first year burden hours and costs for operators to prepare lesson materials for initial HazCom training.

**Table VII-18: Section 47.61
First Year Burden Hours and Costs for Operations
to Prepare Materials for Initial HazCom Training**

First Year Burden Hours						
Operation Mine	No. of Operations	Time to Prepare for Training Program ^a	First Year Burden Hours	Wage Rates ^b	First Year Burden Costs	First Year Burden Costs Annualized ^c
Coal						
Small (<20)	3,309	2	6,617	\$54.92	\$363,415	\$25,439
Large (20-500)	683	4	2,733	\$54.92	\$150,118	\$10,508
Large (>500)	3	8	22	\$54.92	\$1,230	\$86
Total Coal	3,995		9,373		\$514,763	\$36,033
M/NM						
Small (<20)	10,522	2	21,045	\$44.93	\$945,541	\$66,188
Large (20-500)	1,281	4	5,123	\$44.93	\$230,197	\$16,114
Large (>500)	4	8	29	\$44.93	\$1,312	\$92
Total M/NM	11,807		26,197		\$1,177,050	\$82,394

^a For operations employing fewer than 20 workers it takes 2 hrs. to prepare for training.
For operations employing 20 to 500 workers it takes 4 hrs. to prepare for training.
For operations employing more than 500 workers it takes 8 hrs. to prepare for training.

^b For coal operations supervisor's hourly wage rate = \$54.92.
For M/NM operations supervisor's hourly wage rate = \$44.93.

^c Annualized first year costs = 0.07 x first year cost (one-time).

Section 47.61 Requirement for HazCom Training - Continued

Annual Burden Hours and Costs for New Operations to Develop a HazCom Training Program and Prepare Materials for Initial HazCom Training

New mine operators need time to develop a HazCom training program and to prepare materials for initial HazCom training.

Each year, 227 new coal operations that employ fewer than 20 workers, 73 new coal operations that employ 20 to 500 workers, 570 new M/NM operations that employ fewer than 20 workers, and 19 new M/NM operations that employ 20 to 500 workers will need to develop a HazCom training program and prepare materials for initial HazCom training.

We estimate that it will take an average of 6 hours of a supervisor's time (4 hours to develop a HazCom training program and 2 hours to prepare lesson materials for initial HazCom training) and 2 hours of a clerical worker's time to help develop the HazCom training program for new operations employing fewer than 20 workers, and an average of 12 hours of a supervisor's time (8 hours to develop a HazCom training program and 4 hours to prepare lesson materials for initial HazCom training) and 4 hours of a clerical worker's time to help develop the HazCom training program for new operations employing 20 to 500 workers.

For coal operations the hourly wage rate is \$54.92 for a supervisor and \$19.58 for a clerical worker. For M/NM operations the hourly wage rate is \$44.93 for a supervisor and \$18.44 for a clerical worker.

Table VII-19 shows annual burden hours and costs for HazCom training preparation for new operations.

**Table VII-19: Section 47.61
Annual Burden Hours and Costs For Developing HazCom
Training and Preparing Initial Training for New Operations**

Annual Burden Hours				
Operation Size	No. of New Operations	Superv. Time ^a	Clerical Time ^b	Annual Burden Hours ^c
Coal				
Small (<20)	227	6	2	1,816
Large (20-500)	73	12	4	1,168
Total Coal	300			2,984
M/NM				
Small (<20)	570	6	2	4,560
Large (20-500)	19	12	4	304
Total M/NM	589			4,864
Annual Burden Costs				
Operation Size		Superv. Wage Rate	Clerical Wage Rate	Annual Burden Costs ^d
Coal				
Small (<20)		\$54.92	\$19.58	\$83,690
Large (20-500)		\$54.92	\$19.58	\$53,827
Total Coal				\$137,518
M/NM				
Small (<20)		\$44.93	\$18.44	\$174,682
Large (20-500)		\$44.93	\$18.44	\$11,645
Total M/NM				\$186,328

^a Operations employing <20 workers, 6 hrs. = (4 hrs. to develop program + 2 hrs. to prepare lesson).

Operations employing 20 to 500 workers, 12 hrs. = (8 hrs. to develop program + 4 hrs. to prepare lesson).

^b For operations employing <20 workers, 2 hrs. of clerical time to prepare training program.

For operations employing 20 to 500 workers, 4 hrs. of clerical time to prepare training program.

^c No. of new operations x (supervisor time + clerical time).

^d Annual costs = (no. of new operations x superv. hrs. x superv. wage) + (no. of new operations x clerical hrs. x clerical wage).

Section 47.71 Access to HazCom Materials.

Annual Burden Hours and Costs for Providing Copies of HazCom Information to Miners and Designated Representatives

Mine operators must make copies of HazCom information available to miners and designated representatives who request the information.

Each year, 3,589 coal operations that employ fewer than 20 workers, 1,099 coal operations that employ 20 to 500 workers, and 7 coal operations that employ more than 500 workers will need to provide copies of HazCom information to miners who request them. In addition, 11,985 M/NM operations that employ fewer than 20 workers, 1,272 M/NM operations that employ 20 to 500 workers, and 6 M/NM operations that employ more than 500 workers will also be affected.

For coal and M/NM operators, in all size categories, we estimate that it will take an average of 0.2 hours of a clerical worker's time to process a HazCom information request from each miner. We estimate that 2 percent of miners (including designated representatives) in each size category will request such information. The average numbers of miners per operation are as follows: 5 miners per coal operation and 5 miners per M/NM operation employing fewer than 20 workers; 66 miners per coal operation and 53 miners per M/NM operation employing 20 to 500 workers; 542 miners per coal operation and 811 miners per M/NM operation employing more than 500 workers.

For coal operations the hourly wage rate is \$19.58 for a clerical worker. For M/NM operations the hourly wage rate is \$18.44 for a clerical worker.

Table VII-20 shows the annual burden hours and costs for providing copies of HazCom information to miners.

**Table VII-20: Section 47.71
Annual Burden Hours and Costs for Providing Copies
of HazCom Information to Miners and Designated Representatives**

Annual Burden Hours						
Operation Size	No. of Operations	Time to Make Process Request ^a	No. of Request per Mine ^b	Annual Burden Hours	Clerical Wage Rates	Annual Burden Costs
Coal						
Small (<20)	3,589	0.2	0.1	72	\$19.58	\$1,405
Large (20-500)	1,099	0.2	1.3	290	\$19.58	\$5,680
Large (>500)	7	0.2	10.8	14	\$19.58	\$276
Total Coal	4,694			376		\$7,362
M/NM						
Small (<20)	11,985	0.2	0.1	240	\$18.44	\$4,420
Large (20-500)	1,272	0.2	1.1	270	\$18.44	\$4,974
Large (>500)	6	0.2	16.2	20	\$18.44	\$368
Total M/NM	13,263			529		\$9,762

^a On average, it will take 12 minutes (0.2 hrs.) to process a HazCom information request for each miner.

^b For coal operations employing <20 workers, 0.1 = (0.02 x 5 miners per operation).
 For M/NM operations employing <20 workers, 0.1 = (0.02 x 5 miners per operation).
 For coal operations employing 20 to 500 workers, 1.3 = (0.02 x 66 miners per operation).
 For M/NM operations employing 20 to 500 workers, 1.1 = (0.02 x 53 miners per operation).
 For coal operations employing >500 workers, 10.8 = (0.02 x 542 miners per operation).
 For M/NM operations employing >500 workers, 16.2 = (0.02 x 811 miners per operation).

Section 47.73 Access to HazCom Materials.

Annual Burden Hours and Costs for Operations to Distribute Copies of HazCom Labeling Information and MSDSs to Customers

Mine operators must distribute copies of HazCom labeling information and MSDSs to customers who request them.

Each year, 3,589 coal operations that employ fewer than 20 workers, 1,099 coal operations that employ 20 to 500 workers, and 7 coal operations that employ more than 500 workers, will need to provide copies of HazCom labeling information and MSDSs to customers. In addition, 11,985 M/NM operators that employ fewer than 20 workers, 1,272 M/NM mine operations that employ 20 to 500 workers, and 6 M/NM operations that employ more than 500 workers will also be affected.

For coal and M/NM operations, in all size categories, we estimate that it will take an average of 0.2 hours of a clerical worker's time to copy and distribute HazCom labeling information or MSDSs to a customer.

For coal operations, we estimate that the number of customers making requests will be as follows: 12 for an operation that employs fewer than 20 workers; 24 for an operation that employs 20 to 500 workers; and 52 for an operation that employs more than 500 workers. For M/NM operations, we estimate that the number of customers making requests will be as follows: 24 for an operation that employs fewer than 20 workers; 52 for an operation that employs 20 to 500 workers; and 104 for an operation that employs more than 500 workers.

For coal operations the hourly wage rate is \$19.58 for a clerical worker. For M/NM operations the hourly wage rate is \$18.44 for a clerical worker.

Table VII-21 shows the annual burden hours and costs for operations to provide copies of HazCom information to customers.

**Table VII-21: Section 47.73
Annual Burden Hours and Costs for Distribution of HazCom Labeling Information and MSDSs to Customers**

Annual Burden Hours						
Operation Size	No. of Operations	Time to Make Process Request ^a	No. of Request per Mine ^b	Annual Burden Hours	Clerical Wage Rates	Annual Burden Costs
Coal						
Small (<20)	3,589	0.2	12	8,614	\$19.58	\$168,654
Large (20-500)	1,099	0.2	24	5,275	\$19.58	\$103,276
Large (>500)	7	0.2	52	68	\$19.58	\$1,324
Total Coal	4,694			13,956		\$273,254
M/NM						
Small (<20)	11,985	0.2	24	57,526	\$18.44	\$1,060,778
Large (20-500)	1,272	0.2	52	13,234	\$18.44	\$244,028
Large (>500)	6	0.2	104	128	\$18.44	\$2,359
Total M/NM	13,263			70,887		\$1,307,164

^a On average, it will take 0.2 hrs. (12 minutes) to copy and distribute HazCom labeling information or MSDSs to a customer.

^b The average number of times HazCom information distributed per year, per coal operation, are: 12 in operations employing <20 workers, 24 in operations employing 20 to 500 workers, and 52 in operations employing >500 workers.

The average number of times HazCom information distributed per year, per M/NM operation, are: 24 in operations employing <20 workers, 52 in operations employing 20 to 500 workers, and 104 in operations employing >500 workers.

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