

# Subcommittee on Energy and Mineral Resources

Doug Lamborn, Chairman

Hearing Memorandum

May 23, 2016

**To:** All Subcommittee on Energy and Mineral Resources Members

**From:** Majority Committee Staff  
Subcommittee on Energy and Mineral Resources (5-9297)

**Hearing:** Oversight Hearing entitled: *“Exploring 21<sup>st</sup> Century Mining Safety, Environmental Control, and Technological Innovation”*

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The subcommittee hearing will take place on **Wednesday, May 25th at 2:30 P.M. in Room 1324 Longworth House Office Building**. This hearing will focus on the state of the modern mining industry and contemporary techniques, technologies, and practices of 21<sup>st</sup> century mines.

## **Policy Overview**

- Mining is a modern industry that bears little resemblance to the industry of bygone eras. Modern mining is a safe, environmentally conscious, and high tech industry.
- By all accounts, the health and safety of miners has improved consistently and significantly over time.
- Today’s mining industry is regulated by a multitude of federal and state agencies, which enforce an even greater number of environmental and health and safety laws.
- Companies must gain a social license to operate from the communities around mines by demonstrating to stakeholders that they will be good stewards of the land, air, and water resources.
- Silicon Valley is taking notice of the rapid changes in the mining industry, and is looking to mining companies as partners to develop a 21<sup>st</sup> century resource economy.

## **Invited Witnesses**

*Mr. Mark Board*  
Vice President, Technology & Innovation,  
Hecla Mining Company,  
Coeur d'Alene, ID

*Mr. Carl Brackpool*  
Innovation Team Member,  
NTT Innovation Institute, Inc.,  
East Palo Alto, CA

*Mr. Andrew Watson, PE*  
Director of Business Development,  
MWH Global,  
Denver, CO

*Mr. James (Jim) R. Kuipers, PE, (Minority Witness)*  
Consulting Engineer  
Kuipers & Associates, LLC,  
Wisdom, MT

## **Background**

Since the founding of our nation, the American mining industry has provided the raw materials which make many aspects of modern life possible. Gold, silver, copper, coal, and many other mined resources are not only critical to our economic well-being, but to national security as well.<sup>1</sup> And while mining has always been an economic driver, the industry has changed substantially in the last 100 years. Gone are the days of the canary in the coal mine, hydraulic mining in the West, and many other archaic mining techniques of bygone eras. Modern mining has transformed into a safe, environmentally conscious, and high tech industry.

### *Mining Safety*

By all accounts, the health and safety of miners has improved consistently and significantly over time (Figures 1 and 2). According to statistics from the National Institute for Occupational Safety and Health, the fatality rate in coal mines has dropped nearly a thousand fold since 1908.<sup>2</sup> Fatality and injury data for all mining operations in the United States are closely tracked by the Mine Safety and Health Administration (MSHA), the health and safety

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<sup>1</sup> See generally, Do We Take Minerals For Granted?, available at: <http://minerals.usgs.gov/granted.html>

<sup>2</sup> Coleman, P.J., J.C. Kerkering, "Measuring mining safety with injury statistics: Lost workdays as indicators of risk", National Institute for Occupational Safety and Health, Spokane Research Laboratory

regulatory authority over mining operations. These data, described below, underline the general improvement in health and safety conditions in the mining industry.

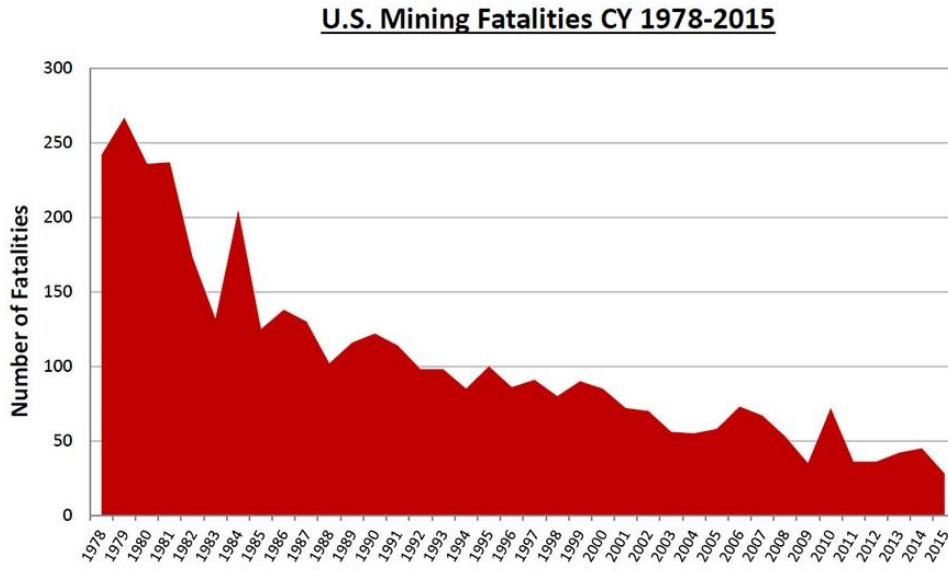


Figure 1: US Mining Fatalities 1978-2015<sup>3</sup>

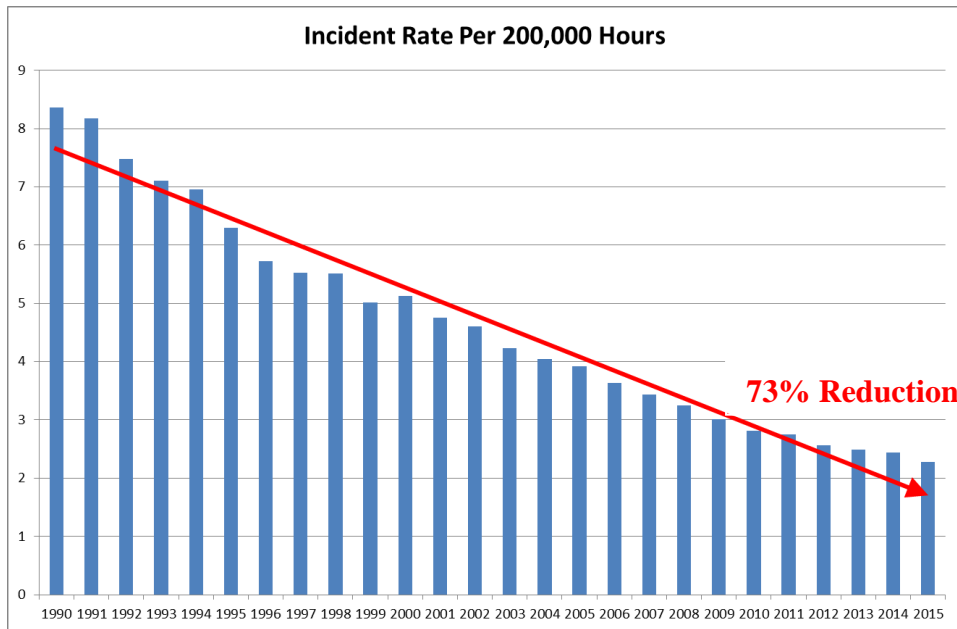


Figure 2: Mining Injury Rate 1990-2009<sup>4</sup>

<sup>3</sup> <https://www.msha.gov/data-reports/statistics/mine-safety-and-health-glance>

<sup>4</sup> <http://arlweb.msha.gov/stats/statinfo.htm>

This downward trend is the result of a combination of regulation, shifts in workplace culture, management priorities, and technical solutions. The regulatory regime in the United States is more prescriptive in its mitigation of health and safety hazards than in other countries, and it has its limitations. No two mining environments are alike and therefore no list of rules, no matter how long, can ever fully capture every health or safety hazard that is encountered in a mine.

Therefore, to further drive down incident rates mining companies are shifting to a culture of safety-based safety programs, rather than simply following regulatory prescriptions. This culture empowers every miner to be in charge of safety. An example of one such is the CORESafety program which is specifically tailored to the mining industry. The companies that have participated in this program over the past five years have averaged a 45% reduction in fatalities and a direct negative correlation between implementation and injury rate.<sup>5</sup>

While MSHA enforces health and safety regulations that apply to the mining industry the National Institute for Occupational Safety and Health (NIOSH) has the mission of eliminating mining fatalities, injuries, and illnesses through research and prevention. The work NIOSH conducts informs regulations and advances in workplace practices. This research and regulatory reform is a slow and often reactionary process. Mining companies are often ahead of the curve when it comes to implementing new technology with the aim of mitigating workplace hazards.

### *Mining Environmental Control*

Severe misconceptions are formed about mining when historical content of mining is applied to modern context. Perceptions held by the public are that mining will have a negative and lasting effect on the environment. Mining is found to be synonymous with pollution, wasteland, and "ugly" strip mining operations. Few are aware of recent advances in reclamation, and when told about reclamation activities people are both enthusiastic and skeptical of the mining companies' willingness to follow through, as though it were not by law.<sup>6</sup>

Today's mining industry is regulated by a multitude of federal and state agencies, which enforce an even greater number of environmental and health and safety laws. Despite this, companies continue to improve environmental controls beyond the standards imposed by these laws. Furthermore, there is a powerful incentive for mining companies to establish good relationships with local communities, and carefully managing environmental risk is an essential component to garnering a social license to operate. This community consent is not given until

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<sup>5</sup> <http://www.coresafety.org/>

<sup>6</sup> Hoffman, J.M., "A Framework for Understanding the Public's Perspectives of Mining Applied to the Kentucky Coal Industry" A PhD Dissertation, 2013

the company has demonstrated to stakeholders that it will be a good steward of the land, air, and water resources, and there won't be lasting environmental hazards. For this reason, mining companies are pioneering the best practices, new technologies, and techniques to mitigate environmental impact and reclaim the land. As is evident in many areas across the country, the mining industry is an important part of the economic and social fabric of the area in which it operates.

### *Technological Innovation*

The technological revolution that is currently taking place across many industries is also having a beneficial impact on the mining industry. The implementation of technology and innovation on health and safety, efficiency, and the environment clearly is having a beneficial effect. The explosion in the use of wireless communication, instrumentation and data monitoring, vehicle and personnel tracking, automation, tele-remote control, and movement away from diesel toward battery and electric equipment have had profound impacts on the mining industry. Today's mining industry has more in common with high-tech manufacturing than it has with the mining industry of a few decades ago.

Silicon Valley is among those taking notice of the rapid changes in the mining industry, and not only because the high-tech industry is one of the major downstream consumers of mined resources. High-tech companies are looking to mining companies as partners in developing a 21<sup>st</sup> century resource economy. The integration of the Internet of Things, Automation, Big Data, and Augmented Reality all have the potential to radically change how mining takes place and mitigate its risks both to humans and the environment.

This hearing will focus on these advances in mining practices and will explore its current state of being a safe, environmentally conscientious, and high tech industry.