

Preliminary Draft Interim Recommendations

1. **The State of Utah should establish an Office of Coal Mine Safety (OCMS) in the Utah Labor Commission or the Division of Oil, Gas, and Mining with a mandate to maximize coal mine safety, coal mine accident prevention, and effective accident response.** The specific responsibilities of the OCMS are set forth in various recommendations listed below.
2. **The State OCMS should be funded and staffed to implement a program of safety inspections of underground coal mines in Utah to supplement MSHA inspections. The Utah State Legislature should examine programs in other states to determine the staffing and enforcement authority for the Utah program. The inspection program should implement a risk-based approach so that inspections are based on analysis of risk factors such as safety record, depth of cover, bump or bounce history, and gas levels.** The program would need adequate start-up funding and time for recruitment and training of qualified inspectors. The Legislature should review the states that have inspection programs, including those that have enforcement authority, to determine whether the OCMS should be delegated authority to order cessation of operations if a serious safety hazard is observed, and should be delegated citation and fine authority consistent with the MSHA program. The OCMS should be delegated rulemaking authority to promulgate regulations consistent with its responsibilities.
3. **The State should enter into an innovative enhanced safety partnership with the Mine Health and Safety Administration to ensure the safety of Utah mines.** This partnership would involve state officials from the OCMS in direct participation with the MSHA inspection and plan approval program to understand the safety steps MSHA has taken since the Crandall Canyon tragedy and to determine how the state can reinforce MSHA safety efforts in Utah mines. The OCMS should pay particular attention to MSHA's expertise and staffing to address bump prone conditions in Utah mines. The OCMS should obtain access to inspection reports, plans submitted for approval, and other information received by MSHA in the regular course of business. The state and MSHA should collaborate on how the state can enhance safety for Utah miners and fulfill MSHA's safety preference for "additional pairs of eyes." This collaboration will include study of the state's role in mine plan approval and the feasibility of a state inspection program in light of the results of the Crandall Canyon accident investigations.
4. **The State OCMS should be tasked with a watchdog monitoring function to ensure that MSHA is carrying out its inspection and other safety responsibilities to the full extent of MSHA's safety mandate.** This role would include monitoring MSHA inspection activities and collection and analysis of

MSHA reports to identify and address areas of attention for miner safety and accident prevention. The state should work with the Utah congressional delegation and other states to secure MSHA cooperation and, if necessary, federal legislation that directs MSHA to cooperate with the state oversight function.

5. **The State OCMS should institute a Coal Mine Safety Ombudsman alert system.** This system would enable any person, especially miners, an opportunity to report any safety concern through all available communications channels (telephone (1-800 number), email, mail, in-person reports). To encourage candor and forthrightness, this system would have strict legal protections that guarantee the privacy and confidentiality of the person making the report. The Ombudsman would investigate and, wherever indicated, act on such reports by taking concerns to the any private or public person or entity, including MSHA and coal operators, who can address the concerns.
6. **The State OCMS should initiate a Coal Mine Safety Roundtable series for coordination and information sharing about safety issues and concerns.** Participation in the Safety Roundtable would include, but not be limited to, representatives of MSHA, state and federal land management agencies (e.g., Division of Oil, Gas, and Mining; School and Institutional Trust Lands Administration, Bureau of Land Management, Forest Service), coal operators, and miner representatives. The Roundtable should meet quarterly to ensure that safety issues are fully discussed and addressed by all participants having an interest in coal mine production and safety. The Roundtable initiative should also serve as a working group to develop a more efficient regulatory framework for the coal operators. Having to respond to multiple agencies with overlapping jurisdictions requires time and resources that could possibly be devoted more effectively to safety concerns. The state should propose to MSHA that the Roundtable serve as a pilot project focused on Utah to develop a more streamlined regulatory process.
7. **The State should establish a Mine Safety Technical Advisory Council (MSTAC) consisting of members drawn from the Technical Advisory Committee to the Utah Mine Safety Commission and other appropriate appointees, including representatives of miners.** The OCMS would provide staff support to the MSTAC. The responsibilities of the MSTAC would include review and recommendation of the most readily available and effective mine safety technology for use in Utah underground mining. Other responsibilities of the MSTAC are set forth in separate recommendations.
8. **The State OCMS should implement an independent technical review process for mining plans that propose operations under unusually challenging conditions in Utah, provided that further consideration by technical advisors can develop workable criteria and efficient procedures to trigger such a review.** The conditions may include depth of cover, bump and fire hazard propensity, attempts at barrier pillar mining, and other risk-based sensitivity factors to be determined in consultation with ground control experts and with

NIOSH. The review would concentrate on roof and ground control and on challenges particularly endemic to Utah coal mines. It would not extend to every ventilation, roof control, or emergency response plan submitted to MSHA. The OCMS, after obtaining independent review, would communicate any concerns it has to MSHA, the mine operator, and any miners' representative involved. The OCMS would work in a cooperative fashion with MSHA and the operator to resolve issues. To address concerns about delay of operations, the state should consider following the Virginia model of conducting its review contemporaneously with MSHA's and under a deadline. The Commission's Technical Advisory Committee (TAC) has examined the concept of applying greater scrutiny to mining plans that propose operations under unusually challenging conditions in underground Utah mines and needs additional time to work through the many challenging technical issues that are involved.

9. **The State should establish a Mine Safety Emergency Response Center (MSERC) at the Western Energy Training Center (WETC) near Helper, Utah to facilitate emergency response training and to house specialized emergency response equipment, such as jet engine fire suppression, gas chromatography, and special tunneling equipment.** The Center would serve underground coal mines in Utah and possibly Wyoming and Colorado and could ultimately serve other mining operations in the Intermountain West. It would provide classroom and field space for advanced emergency response training for industry stakeholders, including executive management, training for community and agency support networks for the mining industry, and specialized safety and rescue equipment that could be used by all participating mines. The Center would be integrated with the WETC training program and would concentrate on mining disaster prevention, emergency preparedness, and emergency response and rescue.
10. **The State should take all steps necessary to ensure that safety concerns associated with liquid and gas hydrocarbon in Utah mines are effectively addressed through federal or state regulation or both. Testimony before the Commission about the hydrocarbon danger experienced at the Willow Creek Mine is the basis for this recommendation.**
11. **The State should establish a Research Institute for Mine Safety and Productivity (RIMSP).** This Research Institute would address the gap in support for mining research since Congress eliminated the U.S. Bureau of Mines in 1996 and the state terminated mine research funding from the State Mineral Leasing Fund in 1999. Similar research programs have been established in Illinois and other coal states. The RIMSP would concentrate on developing improved methods for mining under deep cover and other challenging conditions in Utah and other western states, including safety technology such as communication and tracking capability. Having a recognized research program working with industry would help attract additional funding from other sources such as NIOSH, DOE, and BLM. Research projects should be relevant to Utah mining and focus on

safety and resource recovery. An Institute Board of Trustees consisting of academic, industry, and miner representatives would identify appropriate research topics in collaboration with the OCMS, MSERC, and WETC. Projects could address new mining methods, mine stress detection, planning ventilation systems, simulating mine fires, seismic monitoring, databases for best practices in bump-prone environments, safety modifications of mine machinery, technology for locating miners following an accident, and improved planning tools. The Technical Advisory Committee suggests \$1 million in initial funding, which could come in part from redirected Mineral Lease revenue or a modest research levy on electrical energy produced by coal. Federal and industry funding support also should be pursued.

- 12. The State should upgrade seismic monitoring coverage of the coal-mining region of Central Utah to establish the basic infrastructure for effective regional-scale seismic monitoring of all areas of active coal mining and to enhance seismic monitoring at individual bump-prone active mines.** Utah should seize a one-time opportunity to acquire for permanent use several high-quality, three-component broadband seismometers with associated signal processing, power, and communications equipment. These stations currently monitor the Wasatch Plateau-Book Cliffs coalfields. Under the National Science Foundation "Earth Scope" program, this seismic equipment can be purchased for \$110,000 (plus \$5,000 annual maintenance), a significant savings, and become part of the University of Utah Seismograph Stations' (UUSS) regional network. In addition, to enhance monitoring of mining-induced seismicity (MIS), the state should add above-mine digital accelerographs linked by continuous telemetry to the UUSS for selected active mines. This would require active cooperation and support from the mines and would cost about \$15,000 for each installation, with modest installation and ongoing maintenance costs. The mines could provide the latter funding, as they have done at the three current stations. The Technical Advisory Committee supports this recommendation because the opportunity to analyze correlation of mining activity with MIS may provide important risk assessment information for implementing longwall operations and identifying abnormally stressed pillars. .
- 13. The State should work with the University of Utah Seismograph Stations to develop a program for real time data processing of existing and improved mine-seismicity data to advance mine safety. The program should consider participation of trained personnel located in Utah's coal mining communities to participate in seismic monitoring.** Professor Walter Arabasz, Director of UUSS, has suggested the benefit of encouraging the Central Utah coal mining community to participate in the monitoring process by basing a monitoring training and observation operation in Utah's coal country, perhaps in conjunction with CEU and WETC facilities and programming described in Recommendations #19 and #25. The Commission concurs in this suggestion, recognizing that such a program needs careful study, funding, and support from the coal operators.

- 14. The Mine Safety Technical Advisory Council (MSTAC) should evaluate the seismic monitoring system and work with the University of Utah Seismology Stations and the coal operators to determine whether investment should be made to achieve a high-resolution seismic monitoring capability at individual mines involving both in-mine and surface instruments.** Professor Arabasz reports that this type of intensive seismic monitoring in coal mines is uncommon in the United States but has been pursued aggressively in Australia, Canada, China, Eastern Europe, and South Africa. The Commission recommends a thorough assessment of safety benefits, feasibility, costs, and public and private financing options.
- 15. The State should organize and sponsor a technical symposium on the causes of mountain bumps in coal mining areas and best practices to improve safety. The symposium may become an annual event to address safety issues specific to Utah and the West.** The Commission recommends that this symposium take place in late spring or early summer at an appropriate Utah location. The planning committee would consist of representatives from the MSTAC or the Commission's Technical Advisory Committee. The focus of the symposium should be on improving mine safety consistent with a strong coal mining economy in Utah. In addition to presentations on the Crandall Canyon tragedy, topics could include:
- a. Improved safety training focusing on recognition of conditions contributing to bumps;
 - b. Methods currently in use to reduce likelihood of damaging bumps;
 - c. Summaries and lessons learned from past events;
 - d. Strengths and limitations in pillar design procedures and mine layout practices;
 - e. Remaining Utah coal resources and probable future coal mining conditions;
 - f. Opportunities for industry, MSHA, NIOSH, BLM, and academia to work together on research designed to improve safety and productivity in Utah coal mines (development of theory, laboratory investigation, and field verification); and
 - g. The present and possible roles of government agencies in assuring safety in bump-prone coal mines.

Funding for the symposium could come from sponsors, federal sources, registration fees, and modest state support.

- 16. The State should provide increased and stable funding for mining engineering education. This support is needed for faculty resources, curricular offerings, and the recruitment and retention of students. A logical source of this support would be to include mining engineering as an essential component of the statewide Engineering Initiative.** The Commission has received significant evidence of a serious ongoing and accelerating shortage of mining engineers who are critical to the safety and well-being of coal production in Utah. The University of Utah Department of Mining Engineering has seen a

decline in student enrollment in spite of high coal industry demand for its graduates. According to Professor McCarter, Chair of the Department of Mining Engineering, the 12 accredited mining engineering programs in the United States produce about 130 graduates each year, but the annual need for mining engineers is 300 per year nationwide. About one-fourth of all positions in mining engineering will become vacant in the next two years. In response to similar conditions in other engineering fields, the Legislature over several years has approved funds to hire faculty and improve facilities to facilitate program improvements and student enrollment. However, this funding has not been used in any substantial way to improve mining engineering education. The Department of Mining Engineering needs to expand its faculty to a recommended level of six full-time professors to educate the engineers who will be needed on the technical staffs of Utah mines. The Department also needs to offer adequate student financial aid to recruit the students who will be needed for these positions. Inclusion of mining engineering in the Engineering Initiative would assist in achieving this goal.

- 17. The State should support a public education campaign focused on Utah public schools to provide information about careers in mining and natural resources.**
- 18. The Western Energy Training Center (WETC) should be the focal point for delivery of a comprehensive, state-supported training curriculum to foster miner safety and accident prevention in Utah's coal mines and to facilitate emergency rescue and response to coal mine accidents. The training program should be designed to address safety issues under Utah mining conditions, including improved training on the threat from coal mine bumps**
- 19. The State should support WETC's training efforts to prepare coal mining personnel to conduct safe operations and to enable the industry to recruit and retain qualified coal mine workers.** The Commission received testimony from multiple sources about the looming shortage of mining personnel in Utah and the nations. The National Mining Association estimates that 50,000 new miners will be needed over the next five to seven years as demand rises and aging workers retire. WETC should receive support to offer basic skills training through qualified instructors and a rigorous curriculum offered through classroom sessions and simulated mining environments for new mine workers and for continuing education and training for experienced miners. WETC should be encouraged to work with various workforce transition programs such as Job Corps as a promising pathway for new miners to enter the Utah workforce. Once operational, the regional seismic monitoring network described in Recommendation #122 could provide valuable laboratory experience for students in instrumentation and data collection.
- 20. The State should seek federal administrative and/or legislative flexibility for WETC and the Utah Labor Commission to design training and certification**