THE UNITED MINE WORKERS OF AMERICA, AFL-CIO/CLC

REPORT ON THE

Sago Mine Disaster

OF JANUARY 2, 2006

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United Mine Workers of America

CECIL E. ROBERTS
INTERNATIONAL PRESIDENT

TELEPHONE
(703) 208-7220
FAX (703) 208-7132

UNITED MINE WORKERS' HEADQUARTERS
8315 LEE HIGHWAY
Fairfax, VA
22031-2215

At approximately 6:30 am on January 2, 2006, an explosion occurred at the Sago mine in Upshur County, West Virginia. Fifty-two hours later, the bodies of 12 miners had been recovered from the mine and one unconscious survivor had been transported to the hospital.

Those 12 men did not have to die. But they did, as a result of a series of decisions that were made by the mine's owner, and allowed by the state and federal agencies that are charged with mine safety.

Some of those decisions were made in the weeks and months immediately prior to the explosion and in the hours immediately after it. Sadly, some of those decisions were made many years prior to the explosion.

But whenever they were made, all of those misguided decisions contributed to this preventable tragedy. And without immediate action by mine operators and regulatory agencies across America to reverse the effects of these decisions, more tragedies are inevitable.

The mine's owner, the International Coal Group (ICG), has advanced the theory that the explosion was caused by a natural event it could do nothing to prevent—a lightning strike. ICG touts this theory even though the lightning struck over two miles away and there was no conduit for an electrical charge from that lightning to get into the sealed area of the mine where the explosion occurred. Though it cannot adequately explain why, the West Virginia Office of Miners' Health, Safety and Training agrees with that theory.

The UMWA does not agree with that unprecedented theory, and this report lays out the reasons why. We find it is much more likely that the explosion was triggered by frictional activity in the roof, roof support or support material, which created an electrical arc underground that ignited an explosive methane-air mixture in the sealed area.

Although it is important to know how the methane ignited, it is not really material to the subsequent deaths of the 12 miners. The conditions in the mine at the time of the ignition caused these 12 tragic deaths. The fact is that the tragedy that morning was preventable and should never have occurred. What adds insult to injury is that at least 11 of those 12 miners survived the explosion, and when miners survive an explosion underground, those miners should come out of the mine alive.

The reasons why these 12 men are dead—when they should not be—must be the focus of efforts to improve mine safety from this point forward. And we must start with this: The will and intent of Congress when it first passed the Coal Act in 1969 and then the Mine Act in 1977 has been diluted, modified and subverted by the federal Mine Safety and Health Administration (MSHA) and mine operators to the point where some practices and policies in place today offer miners little more protection than they had before those laws were passed. The various state safety and health agencies are also culpable for failing to protect miners.

1. When MSHA decided to ignore Congress' mandate to build "bulkhead seals" and began allowing substandard seals, including seals from foam material called Omega Block, we began down the path to the Sago tragedy. Had the seals in the Sago mine been constructed in such a manner as Congress intended, it is very likely all the miners killed at Sago would have survived.

2. When the coal companies and the regulatory agencies decided not to pursue enhanced two-way communications underground, even though the UMWA and others raised this as a problem even before 1968, it ensured that no one would be able to talk to the trapped Sago miners in 2006 to let them know their way out of the mine was not blocked.

3. When MSHA decided to mitigate the law as passed by Congress and not require that there be a sufficient number of mine rescue teams available at all times when miners are underground at every mine in America, it meant that ICG was free to contract out its mine rescue functions to an inexperienced mine rescue team that was not on site and had to be gathered from the far corners of Upshur County before it could begin any type of rescue operation. There was no team available to immediately respond at Sago, perhaps rescuing all the miners who survived the explosion instead of just one.

4. When Sago mine management submitted and MSHA approved a ventilation plan that would course fresh air past the sealed area, and this contaminated air was separated from the working section's intake air supply by only one brattice wall which was destroyed in the explosion, it meant that the trapped miners were doomed to a continuous flow of carbon monoxide and other deadly gases that eventually killed all but one of them.

5. The lack of additional oxygen supplies and the poor performance of the self-contained self-rescue (SCSR) units, along with the failure by MSHA over the past 30 years to require the development of a new generation of SCSRs, meant that these trapped miners were left gasping for their final breaths.

6. When MSHA decided not to follow up on Congress' mandate in 1969 to require safety chambers in mines, that meant the miners at Sago were left with hanging a ventilation curtain as their only option in a futile attempt to keep the deadly gases away.

7. When MSHA did not require the use of tracking devices to locate trapped miners underground, even though such technology has been available for over 30 years and is used widely in other countries, the mine rescue teams that finally did enter the Sago mine did not have any idea where to look for the trapped miners, further delaying the rescue efforts.

All of these issues are examined in depth in this report. The UMWA also makes recommendations in this report that, if enacted and enforced, will make a real difference, not just in the ability of miners to survive explosions and other incidents underground, but to keep these events from happening in the first place.

The truth is that ICG failed the miners at Sago, and so did our government. And when our government failed those miners it failed all miners. The company and the government agencies forgot the words of Congress, stated in the preamble of the Mine Act: "Congress declares that the first priority of all in the coal or other mining industry must be the health and safety of its most precious resource—the miner."

The UMWA has not forgotten those words. We believe they must be in the forefront of our nation's focus as we move forward to improve safety in America's coal mines. The 12 who died needlessly at Sago and the 35 others who perished at coal mines throughout the United States in 2006 deserve no less.

Cecil E. Roberts
International President

Daniel J. Kane
International Secretary-Treasurer

Dedication

The United Mine Workers of America dedicates this report to the entire mining community: the men and women who work in the industry, their families and friends and the miners who courageously arrive at the mine to offer assistance when tragedy strikes.

History will judge 2006 to be a tragic and difficult year for the nation's mining community. By the end of the calendar year, the coal industry claimed the lives of 47 miners. The fatal accident numbers of the previous years have been surpassed, making it the worst year since 1995, when there were also 47 fatal accidents. But numbers do not tell the entire story: indeed they dehumanize the message and make it easier to accept. These miners must not be remembered merely as numbers. Theirs was a life of hard work, sacrifice and dedication. These miners were:

Miner	Date	Age	Mine	Mine Controlling Company
Terry Helms	1-2-06	50	Sago	International Coal Group
Marty Bennett	1-2-06	51	Sago	International Coal Group
Thomas Anderson	1-2-06	39	Sago	International Coal Group
James Bennett	1-2-06	61	Sago	International Coal Group
Jerry Groves	1-2-06	56	Sago	International Coal Group
Jesse Jones	1-2-06	44	Sago	International Coal Group
Junior Hamner	1-2-06	54	Sago	International Coal Group
Martin Toler	1-2-06	51	Sago	International Coal Group
David Lewis	1-2-06	28	Sago	International Coal Group
Jack Weaver	1-2-06	51	Sago	International Coal Group
Fred Ware	1-2-06	59	Sago	International Coal Group
Marshall Winans	1-2-06	50	Sago	International Coal Group
Cornelius Yates	1-10-06	44	Mine #1	Maverick Mining Company
Don Bragg	1-19-06	35	Aracoma Alma Mine #1	Massey Energy Company
Ellery Hatfield	1-19-06	47	Aracoma Alma Mine #1	Massey Energy Company
Shane Jacobson	1-29-06	37	Aberdeen	Andalex Resources, Inc
James Thornburry	1-23-06	72	No. 4	Sassy Coal Company
Edmund Vance	2-1-06	46	#18 Tunnel Mine	Long Branch Energy Corp.
Paul Moss	2-1-06	58	Black Castle	Massey Energy Company
Timothy Caudill	2-16-06	33	HZ4-1	TECO Energy
Willard Miller	2-17-06	35	Mettiki Mine	Alliance Coal, LLC
Jackie Toler	4-7-06	53	Candice 2	Rainbow Trout Coal, LLC
Robert Runyon	4-7-06	48	No. 1 Mine	Southern WV Resources
Garry Jones	3-29-06	57	No. 4 Mine	Jim Walter Resources, Inc.
David Bolen	4-20-06	28	No. 1	Tri Star Coal LLC
Rick McKnight	4-21-06	45	Huff Creek No. 1	Arch Coal, Inc.

Miner	Date	Age	Mine	Mine Controlling Company
Jimmy Lee	5-20-06	33	Darby Mine No. 1	Kentucky Darby LLC
Amon Brock	5-20-06	51	Darby Mine No. 1	Kentucky Darby LLC
Roy Middleton	5-20-06	35	Darby Mine No. 1	Kentucky Darby LLC
Bill Petra	5-20-06	49	Darby Mine No. 1	Kentucky Darby LLC
Paris Thomas, Jr.	5-20-06	35	Darby Mine No. 1	Kentucky Darby LLC
Steven Bryant	5-23-06	23	Risner Branch #1	Miller Bros. Coal Inc.
Todd Upton	5-24-06	34	Sycamore Mine #2	International Coal Group
Edward R. Fitzgerald	7-7-06	35	East Volunteer	Alliance Coal, LLC
Jason Mosley	7-18-06	28	Smith Branch #1	Hendrickson Equipment Inc.
John May	7-20-06	39	Slate Branch	CAM Mining LLC
Jeremy Heckler	7-30-06	30	Star Bridge Prep Plant	Circle M Enterprises Inc.
Richard Cox	5-4-06	40	Buchanan Mine #1	Consolidation Coal Co.
Joseph Seay	10-6-06	56	Mine No. 2	D & R Coal Co., Inc.
Jerry McKinney	10-11-06	56	No. 7 Mine	Jim Walter Resources, Inc.
Thomas Channell	10-20-06	49	Whitetail Kittanning	Alpha Natural Resources, LLC
Dale Reighter	10-23-06	43	R & D Coal Co	R & D Coal Co.
Brett Gibson	10-30-06	31	Double Bonus Coal Co.	Bluestone Industries, Inc.
Tony Swiney	11-4-06	44	Mine #23	James River Coal Co.
Howard Harvey	11-5-06	52	Kayenta Mine	Peabody Western Coal Co.
Mario Corriveau	11-28-06	50	Spring Creek Coal Co.	Rio Tinto Energy America
John Elliot	12-17-06	26	Prime No. 1	Dana Mining Co., Inc.

On behalf of the United Mine Workers of America, we wish to express our deepest sorrow and heartfelt sympathy to the families of these brave men over the untimely death of their loved ones. The passing of each is not only a shocking loss to their families, but to all miners and the members of the UMWA. Their deaths are a reminder of how tragically short life can be and how dangerous coal mining can be, especially if safety laws are not followed by coal operators and enforced by government regulators.

Words alone cannot atone for the tremendous loss their families have sustained, but we trust that in their hour of bereavement they and all members of their families will obtain some solace in knowing that others share their sorrow and weep with them in their misfortune.

The Union offers a special thanks to the wives, the sons, the daughters and all the family members who, after their tragic loss, found the strength of will to fight for those who still work in the nation's mines. When you put your grief aside and testified in Congress and state legislatures, spoke out in the media, participated in public hearings and spoke truth to power, you brought a powerful and eloquent message on behalf of all miners to those who might otherwise ignore it. Though you do not know most of them, you saw the struggle miners were facing and made it your own. You gave them a voice, and today they are safer because of your efforts. Thank you on behalf of the nation's miners for all you do for them.

We must also recognize those who willingly enter burning, smoky and unstable mines to try to rescue those who cannot escape on their own. We owe each of you a deep debt of gratitude. When conditions are at their worst and most would judge the situation to be too dangerous, members of the nation's mine rescue teams are ready to offer assistance to their brothers and sisters in harm's way. Each of you plays a significant role in protecting and saving the lives of countless miners every day. You share in the joy when your efforts are successful,

but suffer a unique and painful sense of loss when your efforts are met with tragedy. The difficult task you take upon yourselves does not get easier with time or better with experience; it remains a challenge that is ever-changing and dangerous.

The facts are simple: You are the first to enter and the last to leave a disaster site. You witness the happiness of families and friends as their loved ones emerge from the mine because of your efforts. You witness the horror of the industry and feel the loss as few others can understand. And you return each time you are called, because it is who you are. Thank you on behalf of this nation's miners, their families, their friends and the United Mine Workers of America.

Finally, we must also recognize all the men and women who have lost their lives to build and energize the nation. When tragedy strikes, whether it is one miner or many in a single moment, we feel the loss and pain as only miners can.

We dedicate this report to each of you, and to your families. More importantly, we pledge to continue the fight for even greater protections. Because like every American worker, coal miners must be secure in the knowledge that they will return safely to their loved ones at the end of every shift.

Executive Summary and Recommendations

Based on information gathered during the investigation of the January 2, 2006, explosion and subsequent fatalities at the Sago mine, the United Mine Workers of America (UMWA) issues the following report.

Though the miners at the Sago mine were not members of the UMWA or any other union, the UMWA was designated under federal regulations as a miners' representative after this incident.

The explosion may have claimed one life immediately. Over the course of the next several hours eleven of the men died as a result of these conditions. The lone survivor, Randall McCloy, Jr. was rescued approximately 40 hours after the explosion.

The Union believes that there is absolutely no clear evidence to support the theory that lightning was the cause of the explosion. Further, there is no evidence that lightning striking the ground near a mining operation has ever traveled into the underground area of a mine, without the presence of a conduit from the surface into the mine, and then caused an ignition or explosion of gas or dust.

The Union has determined that the most likely cause of the explosion was conditions contained solely within the sealed area of the mine where the explosion occurred. The lightning strike theory is based entirely on circumstantial evidence and is so remote as to be practically impossible.

The UMWA concludes that the most likely cause of the explosion was frictional activity from the roof, roof support or support material which ignited the methane-air mixture.

The union firmly believes that 12 men are dead today who should not be. The UMWA believes that if the mine's operating company, the International Coal Group (ICG) had put safety ahead of profit and if the Mine Safety and Health Administration (MSHA) had followed the mandates established by Congress in the 1969 Coal Act and the Federal Mine Safety and Health Act of 1977, all 12 of the trapped miners would have survived and given the circumstances it is likely all 13 would be alive today.

The Agency's decisions over the past several decades to promulgate regulations, grant petitions for modification and create policies that contradict the intent of Congress by reducing or eliminating the legislated protections played a major role in the tragic events of January 2, 2006.

Likewise, decisions Sago mine management made in operating the mine, including ventilation plans, roof control plans and its extremely rare practice of second mining created conditions in the mine that were inherently risky. The Union believes that the company's flawed plans and mining practices contributed to the devastating events of January 2, 2006.

Knowing the cause of the explosion is important so that steps can be taken to prevent a similar situation from happening again. However, regardless of the cause of the explosion in this instance, had MSHA followed the mandates of Congress, and had ICG operated the mine with an eye firmly focused on miners' safety, there is every reason to believe that every person underground that day would have survived.

MSHA's responsibilities under the law

The 1969 Coal Act and the 1977 Mine Act followed years of neglect and indifference to coal mine safety. In 1969, following the 1968 Farmington explosion that claimed the lives of 78 miners, 19 of whom are still entombed in the mine, Congress for the first

time demanded that miners be afforded safer working conditions. In 1977, Congress expanded upon those protections and created MSHA to enforce these directives.

However, in the nearly three decades since 1977, the Agency has routinely ignored the wishes of Congress and in many instances created regulations, granted petitions and established policies directly opposite to its mandate. These actions by MSHA contributed to the events of January 2, 2006. These failures by the Agency include:

Requirements for seals. Had MSHA required Sago mine management to build the seals to the requirements of the Mine Act, the seals would have contained the explosion and the noxious gases it generated sufficiently to permit the safe escape of all the miners.

Congress mandated in the 1977 Mine Act that "explosion-proof seals or bulkheads" be used to isolate abandoned or worked out areas of the mine from active workings.

In subsequent years MSHA has promulgated regulations regarding seals that are much less protective than what Congress mandated. The current law simply requires that seals withstand static pressure of 20 pounds per square inch (psi) in order to be approved for installation in the mine.

At Sago, ICG requested and MSHA approved the use of Omega Block—blocks made of foam—to seal an area instead of the explosion-proof seals or bulkheads required in the Mine Act. Use of Omega Blocks directly contributed to the effects of the explosion and the deaths of all the miners.

Mine Rescue Teams. The need for well trained, well equipped and readily available mine rescue teams has been understood for many years. In 1977, Congress ordered MSHA to propose regulations requiring teams be available at every mine in the event of an emergency.

In July 1980, MSHA promulgated a rule for the creation and deployment of mine rescue teams. The regulation required that two mine rescue teams must be available at all times when miners are underground. Generally larger mine operators established several teams within a mine or throughout a company to meet these requirements. Smaller operators were permitted to contract with these teams to cover their operation.

The Union has historically criticized the contract team concept because there were no regulations to ensure these teams would be able to reach the operation in a reasonable time or be familiar with the operation once they arrived.

Since 1980, MSHA has used policy directives to erode the effectiveness of the mine rescue team rules. These policies permit mine operators to rely on geographically distant contract teams. MSHA also allowed "composite" teams, with miners from several different operations. Often, these composite team members have not trained together as a unit, and may not have ever trained at all the mines they were responsible for.

The adverse consequences of this flawed mine rescue system played a significant role in the response to the Sago mine. The first team, a composite contract team, did not arrive on the property until approximately 4-1/2 hours after the explosion. Other teams arrived later that morning and afternoon. This delay contributed to the ultimate outcome of the disaster.

Had mine rescue teams been immediately available and on-site more quickly, the tragic outcome may have been averted.

Emergency Shelters. Had MSHA required the installation of properly equipped emergency shelters, as it was given the authority to do in the 1977 Mine Act, the miners at Sago could have survived for hours, if not days, underground.

In the decades since Congress passed the Mine Act very little has been done to develop and deploy these chambers despite repeated instances where miners were trapped underground. The Sago miners represent but one example where miners were forced to retreat to an area of the mine to build a barricade and hope for rescue. Technology exists today to correct this situation, yet operators in this country—including ICG—have refused to utilize it and MSHA fails to require it.

Communications. Not until 1969 did Congress mandate two-way communications from the sur-

face of the mine to all active working sections. In 1969 communications were facilitated by the use of a "twisted pair" of wires connected to battery-powered phones. Thirty-eight years later this primitive communication system is still the primary source of communications in the industry.

Yet Congress specifically directed MSHA to promulgate regulations that will spur the development of new technology. The Agency has failed to do that in many ways, including failing to require state-of-the-art communications systems. Despite the requirements of the Mine Act to, "conduct such studies, research, experiments and demonstrations as may be appropriate...to develop new and improved methods of communication from the surface to the underground area of a coal or other mine," the Agency did little to fulfill this mandate.

Had MSHA pursued new technologies as Congress directed, there is every reason to believe that a system could have been in place that would have permitted the trapped miners to communicate from the 2nd Left Parallel Section and facilitate their rescue.

MSHA's responsibilities as a watchdog for safety

MSHA has ignored the mandates of Congress by promulgating inadequate regulations and setting disastrous policies on several occasions. These actions have negatively impacted miners' safety and health for years. Moreover, MSHA has not learned from tragic events that occurred in the past.

The mine explosion at Farmington in 1968 and the fire at Wilberg in 1984 took the lives of 105 miners. The lives of each of these miners and many others lost to their families are a tragedy that cannot be forgotten. These events should have pushed everyone to address the shortcomings and needs of the industry and make it safer for all miners.

These two disasters alone demonstrated that miners trapped in the aftermath of a fire or explosion need an adequate supply of oxygen to sustain them until rescue, and that locating trapped miners quickly is crucial to their survival. They also demonstrated that if sufficiently protective regulations are promulgated and enforced, a miner who survives the initial disaster should come out of the mine alive, even after an extraordinary event such as a fire, inundation or explosion.

Tracking devices. Since before the Farmington disaster, one of the greatest impediments to mine rescue has been locating the trapped miners. Having the ability to immediately send mine rescue personnel to the location of trapped miners after a disaster is key to their survival. The U.S. Bureau of Mines tested a system capable of locating trapped miners in 1970 and published its successful results. It was not until after the Sago tragedy that any real movement has been made in this country to create an effective tracking device for implementation into the mining environment.

The facts here are simple: Had miners at Sago been outfitted with tracking devices that would show their location both pre-and-post accident they could have been saved. The Agency, by not promulgating technology-driving regulations as Congress intended, failed these miners.

Oxygen. There was not a sufficient supply of oxygen to sustain each miner trapped at Sago until mine rescue teams could reach them in the hours after the explosion.

The Union has consistently argued that, in the event of a disaster, sufficient oxygen must be available to every miner that will allow that miner to travel from the deepest penetration of the mine to the surface.

In the early 1980's MSHA finally required mine operators to supply miners with 1 hour of oxygen in the form of a Self-Contained Self-Rescuer (SCSR) to begin an escape.

While not enough, this was an important step forward. However, since the mid-1990's SCSR technology has stagnated. The Agency has not pushed for SCSR advances and those who perished at Sago were carrying rescue devices that rely on technology over a decade old.

Moreover, MSHA did not require additional units to be available for miners who could not reach the surface of the mine from their workplace in the limited time the oxygen in a single SCSR provides.

At the time of the Sago tragedy, ICG satisfied only the minimal requirement of one SCSR per miner.

Some operators, however, provided additional oxygen to underground miners.

At Sago, some SCSRs did not even function as intended. Units failed outright and others did not produce sufficient on-demand oxygen to allow the miners the best possible chance for escape.

The mine operator's responsibilities

Decisions of mine management at Sago played a large role in the tragedy that unfolded at the mine on January 2, 2006.

The company submitted and MSHA approved a ventilation plan just weeks before the explosion that would course fresh air past the sealed area. This contaminated air was separated from the working section's intake air supply by only one brattice wall, which was designed to withstand minimal pressure. This brattice wall was destroyed in the explosion with disastrous consequences.

The extremely rare practice of "second mining" that was employed at Sago created entry heights in excess of 18 feet in some areas, which is inherently dangerous because it increases hazards associated with roof falls and rib rolls.

In addition, the height of the entry permits methane to accumulate in the area at volumes much greater than would normally be the case. When the methane in these areas is ignited, as was the case at Sago, the forces from the explosion are compressed as they radiate outward into the entries that were not part of second mining.

This compression, commonly referred to as "piling", increases the magnitude of the forces, creating much greater than normal pressure from the original explosion.

Mine management is responsible for its contributions to this tragedy. It is not sufficient for the company to merely rely on MSHA approvals of flawed plans the company submitted. Mine management is responsible for the operation of a mine. Management at the Sago mine failed the miners.

The events that led to the explosion were rooted in flawed decisions. These decisions were made not only in the months leading up to the explosion, but also over the many decades that MSHA has ignored the mandates of Congress and needs of miners.

Summary of the events of January 2, 2006

The explosion occurred inby an area of the mine that had been recently sealed as a result of very poor mining conditions. The seals, which were completed on December 12, 2005, were constructed using Omega Blocks. This was the first time such seal material had been used at this operation. Previously, seals constructed at this operation were solid concrete block or packsetter-type construction.

There were roof falls above the bolt anchorage point in the 2nd Left Mains Section before and since December 2005, when the area was sealed. The investigation revealed that roof conditions continued to deteriorate after the area was sealed.

Studies completed by MSHA and the West Virginia Office of Miner's Health, Safety and Training (WVOMHST) determined the approximate area of and the methane liberation within the sealed area. Based on this data an explosive methane-air mixture would have been created approximately 14 days after completion of the seals, on December 26, 2005. Had there been no interruption, the methane-air mixture within the sealed area would have remained in the explosive range until about January 22, 2006, when the atmosphere would have passed through the explosive range, and become inert.

Permitting these conditions to continue without being actively monitored created an extremely hazardous situation.

The explosive forces of the blast traveled from its epicenter in the sealed area outward in all directions. These forces generated significant heat and pressure waves within the sealed area. They struck the inby sides of the Omega Block seals, pushing them outward toward the working area of the mine, completely obliterating nine seals. The remaining seal, located in the #1 entry, failed catastrophically and was blown against the adjacent rib-line.

When the explosion occurred, there were 29 miners underground in various locations. Terry Helms, mine examiner/beltman, had completed his preshift examination and was located near the 2nd Left

switch. Before the explosion, Fred Jamison, mine examiner/beltman had completed his preshift examination, entered his findings in the examination book on the surface and walked back underground to his work location along the beltline.

The 2nd Left Parallel Crew

The 2nd Left crew had entered the mine at approximately 5:55 am and proceeded to the Section. They were moving towards their work stations in the Section when the blast occurred at 6:26 am. The forces from the explosion traveled from the seals and entered the active workings of the mine. The forces continued to travel several thousand feet, destroying communication devices, ventilation controls and other equipment. The force of the blast struck Terry Helms.

The forces from the explosion entered the 2nd Left Parallel Section, damaging communication devices and ventilation controls and immediately filled the area with smoke, dust and noxious gases. The 12-man crew proceeded to the mantrip and attempted to evacuate the Section. Smoke and dust in the mine atmosphere severely limited their visibility and worsened as they moved toward the mouth of the Section. They proceeded outby until they were stopped by debris on the track and zero visibility, interfering with their further escape.

The crew exited the mantrip and walked into the intake escapeway. There are conflicting reports about when the crew members donned their self-contained self-rescuers (SCSRs), but from the location of the discarded cases it seems they performed this task once they entered the intake entry.

An attempt was made to walk out the intake escapeway, but smoke and gases from the explosion were blowing directly onto the crew. They then proceeded to the face of the #3 entry and built a barricade to isolate themselves from the smoke and noxious gases. Two members of the crew made a second attempt to find a safe escape route, but were turned back by heavy smoke and gases.

Over the course of the next several hours, members of the 2nd Left Parallel crew followed the established procedures for barricaded miners by pounding on a roof bolt at their location. During this process, they would pound several times on the roof bolt and wait for a response in the form of a shot set off on the surface. However, no one on the surface was listening because seismic equipment was never deployed, so the trapped miners never received a response. Over the course of the next several hours, 11 of the 12 miners from 2nd Left Parallel crew died from the poisonous mine atmosphere.

The 2nd Left Parallel crew:

Martin Toler Section Foreman	victim
Marshall Winans Scoop Operator	victim
Jerry Groves Roof Bolter Operator	victim
James Bennett Shuttle Car Operator	victim
Marty Bennett Continuous Miner Operator	victim
Fred Ware Continuous Miner Operator	victim
Jesse Jones Roof Bolter Operator	victim
Thomas Anderson Shuttle Car operator	victim
Jack Weaver Electrician	victim
David Lewis Roof Bolter Operator	victim
Junior Hamner Shuttle Car Operator	victim
Randall McCloy, Jr. Roof Bolter Operator	survivor

The 1st Left Crew

The 1st Left crew had entered the mine at approximately 6:10 am. They dropped off John Boni, pumper, at the 1st Right pumper shanty and Pat Boni,

beltman, at the No. 4 belt drive. The 13-member crew then proceeded inby to the Section. At the mouth of 1st Left Section, Roger Perry, miner operator, threw the track switch to enter the Section, returned and sat down on the mantrip when the explosion occurred.

Immediately after the explosion, these miners felt a strong gush of air and visibility was virtually zero in the track heading. Miners from the 1st Left crew and outby areas immediately began to evacuate the mine through the track heading and intake escapeway. By 7:30 am, fifteen of the miners outby the 1st Left Section, including John and Pat Boni and Fred Jamison, had reached the surface and only Owen Jones, 1st Left Section foreman, remained underground.

Mine Management

Jones was met in the track heading by Jeff Toler, Superintendent; Al Schoonover, Safety Director; Denver Wilfong, Maintenance Superintendent, and Ernest Hofer, Maintenance Foreman, who entered the mine immediately after the explosion, at about 6:45 am. The five men traveled up the track and intake entries, repairing damaged ventilation controls as they proceeded. They reached 58 block of No. 4 belt, located at the mouth of 2nd Left Parallel Section. They encountered heavy smoke and carbon monoxide, which stopped them from advancing any further. They shouted towards the Section, but received no response. They decided to exit the mine and call for mine rescue teams. They reached the surface at approximately 10:30 am.

Twelve members of the 2nd Left Parallel crew and Terry Helms were underground and unaccounted for. There had been no contact with any of these miners since they entered the mine at about 5:55 am.

Initial Response

There was no attempt by mine management to immediately implement the mine's emergency evacuation plan or contact the appropriate regulatory agencies. Despite a call to the surface by Jones at approximately 6:35 am for help ("We had…an explosion…get the people in here."), attempts to contact MSHA and the WVOMHST were not initiated until 7:20 am, nearly one hour after the explosion. The decision to notify the agencies was made by Jeff Toler while underground attempting to rescue the 2nd Left Parallel crew. Those remaining on the surface after the explosion failed to take charge of the situation. The chaos that followed continued during the entire rescue and recovery operation.

The 1st Left crew:

Owen Jones	Section Foreman
Gary Rowen	Roof Bolter Operator
Randy Helmick	Roof Bolter Operator
Alton Wamsley	Roof Bolter Operator
Joe Ryan	Roof Bolter Operator
Roger Perry	Miner Operator
Denver Anderson	Utility Man
Chris Tinney	Utility Man
Ron Grall	Mine Examiner
Eric Hess	Scoop Operator
Paul Avington	Equipment Operator
Hoy Keith	Mechanic
Gary Carpenter	Continuous Miner Operator

Officials from ICG, MSHA and WVOMHST arrived at the mine by 10:30 am. Control orders were placed on the mine by the regulatory agencies to prepare for mine rescue teams to arrive and begin their activities. The first rescue teams arrived at approximately 11:00 am on January 2, 2006, and other teams that were contacted arrived throughout the rest of the morning and into the afternoon.

There was little control over who entered mine property. Deliberations and plan decisions on rescue efforts were done in unsecured areas. Information that was not verified for accuracy was communicated from the mine site to the families, media and general public. Further chaos was created by ICG's failure to provide adequate accommodations for mine rescue teams as they arrived.

The first rescue plan from ICG was not submitted for approval until 1:00 pm and simply requested

continued monitoring of the gases exiting the mine. Because of indecisiveness and inexperience on the part of ICG, rescue teams did not enter the mine until after 5:00 pm to begin their rescue efforts. Neither of the regulatory agencies ever moved to take control of the rescue operation.

Terry Helms was located by Ron Hixson, a member of the MSHA mine rescue team, at 58 block in the track heading of No. 4 belt at 5:15 pm on January 3, 2006. His body remained in the mine until the early morning hours of January 4, 2006, when the recovery effort was completed.

Mine rescue teams moved into the 2nd Left Parallel Section and, after several hours, a decision was made to break protocol and move immediately to the face area of the Section. Jimmy Klug, Captain of the McElroy Mine Rescue Team, heard someone moaning from the area where the miners had barricaded. Team members called for assistance and immediately began to assess the miners' condition.

An overstretched communication system, resulting from the decision to move to the face, contributed to a problem with unverified information from the face area being communicated through the mine and to the surface. Normal procedures for checking and double-checking information were disregarded. Inaccurate and unverified information that 12 miners were found alive was immediately spread to family members and the nation.

At approximately 12:15 am of January 4, 30 minutes after the initial report to the families and the nation that 12 miners were found alive, mine rescue teams underground informed the command center that the initial information was incorrect. They reported that eleven of the miners were deceased. However, no one in the command center took action to notify the families or anyone else of the error of the earlier report about 12 survivors.

For almost three hours, the families and the nation were not informed that 11 of the miners were actually deceased. After being trapped for more than 40 hours, a single miner, Randall McCloy, Jr., was rescued.

UMWA Findings on the Seals

In late 2005, Sago mine management determined that mining conditions in the 2nd Left Mains Sections had become too dangerous to justify continuing advance development of the area. In sworn testimony given to MSHA and WVOMHST, several miners and management employees cited poor roof conditions and water accumulation as the reasons for abandoning the area.

The Company then initiated a second mining of the Section and began making preparations to permanently seal the area. In September, management sought approval from MSHA to use Omega Blocks to seal the area.

Approval was received from MSHA for the use of non-hitched Omega Block seals on October 24, 2005. Construction of the seals began on the same day and was completed on December 12, 2005. The Company submitted an amendment to use Omega Blocks with a pilaster in the center of the seals for areas in the mine over eight feet in height, as required by MSHA policy. MSHA approved their use on December 8, 2005.

The testimony of miners who built the seals raises serious questions regarding the actual construction of the seals. To begin with, it is apparent that miners were not properly trained in how to construct seals with Omega Block. Miners indicated that the seals were not always anchored to the roof as required because there was not sufficient room to install the wedges. Wedges were used on some of the seals to tighten them from rib to rib, potentially causing weakness in the perimeter of the seal. Whether the bonding agent was applied properly cannot be determined. Miners testified that the bonding cement was poured onto the horizontal layers of the Omega Blocks and applied with both trowels and gloved hands.

The integrity of the seals cannot be verified, because at no time in the installation process or at the completion of their construction were they properly inspected by mine management or officials of the regulatory agencies. In fact, no one from either mine management or the regulatory agencies observed the construction long enough to ensure compliance with the approved plan. *Note: Since the tragedy, MSHA has placed a moratorium on the use of Omega Blocks, and a new minimum 50 psi requirement has been instituted for seals.*

UMWA RECOMMENDATIONS

1. Training of all miners who work on seal construction must be given by a certified person with knowledge of why each construction requirement is necessary to the process. All information in the approved plan must be passed on during the training session.
2. "Tailgate" or descriptive training cannot be permitted for these types of tasks. Training must be comprehensive and clear. The trainer and trainee(s) must also be required to sign documentation that proper training was completed.
3. Inspections of the construction of seals must be conducted by a certified engineer. The inspection must include monitoring the construction for a sufficient time, as well as evaluating the completed seal, to insure each seal is properly installed. The certified engineer should record the findings in an appropriate book.
4. The regulatory agencies should routinely inspect the seal during the construction and at the completion of each seal. Sufficient time for this inspection must be permitted to determine that all seals are properly constructed.
5. The use of Omega Blocks should not be permitted as a ventilation control in any underground mining operation.
6. The National Institute for Occupational Safety and Health (NIOSH) recently released a draft report entitled, "Explosive Pressure Design Criteria for New Seals in U.S. Coal Mines." The UMWA fully endorses the report and its recommendations, as follows:
    a. For unmonitored seals where there is a possibility of methane-air detonation behind the seal, seals should be designed and built to withstand a pressure of 640 psi.
    b. For unmonitored seals with little likelihood of detonation, seals should be designed and built to withstand a pressure of 120 psi.
    c. For monitored seals where the amount of potentially explosive methane-air is strictly limited and controlled, seals should be designed and built to withstand a pressure of 50 psi, if monitoring can assure that the maximum length of explosive mix behind a seal does not exceed 15 feet and that the volume of the explosive mix does not exceed 40 percent of the total sealed volume.
7. The method of seal construction submitted by the operator in the ventilation plan and approved by the agencies must include:
    a. Seals must be hitched into the ribs and bottom a minimum of 6 inches.
    b. A method to continually monitor the atmosphere inby the seals from a remote location on the surface.
    c. Sealed areas must be treated as an integral part of the mine's overall ventilation system, and be specifically designed and approved for each installation at each mine. The seal requirements must be based on several factors, including area to be sealed, special conditions within the area to be sealed and methane liberation.
    d. Seals must be constructed of solid, incombustible material as prescribed in the 1977 Mine Act.
8. The agencies should no longer permit areas of the mine that are sealed to self-inert without continuous monitoring as recommended by NIOSH.
9. Areas of the mine that are to be sealed must be free of all debris that is not permanently installed during the mining process. Materials and supplies such as unused roof support material, posts, oil and hydraulic containers, cables, equipment, belt structure, message or other cables and electrical components or cables must be retrieved and placed in a safe area outside the seals.

UMWA Findings on Methane Accumulation

Information from surveys conducted by MSHA and WVOMHST indicates the sealed area of 2nd Left Mains encompassed approximately 4 million cubic feet. Further testing by the agencies showed that the area liberated about 14,400 cubic feet of methane every 24 hours.

Methane in sealed areas should follow a trend and produce accumulations similar to what is described below. Based on this data from the agencies, and understanding barometric and fan pressures, the relative tightness of the seals to resist leakage and other factors that can affect methane accumulation in the sealed area, the following general assumptions can be made:

December 26, 2005, 14 days after the completion of the seals; the atmosphere in the sealed area would have entered the explosive range with a reading of approximately 5 percent methane.

January 2, 2006, 21 days after the completion of the seals; the atmosphere in the sealed area would have reached approximately 7 - 8 percent methane. This is when the explosion occurred. This concentration is extremely significant based on studies performed by the U. S. Bureau of Mines in 1960. Report of Investigation 5548 (RI 5548) determined that frictional sparking, created by roof strata and roof support material, would cause methane concentrations to ignite. The report also concluded that methane concentrations at about 7 percent would more readily ignite than higher or lower concentrations *(RI 5548 at page 9)*.

Given this basic information, had there been no explosion on January 2, 2006, the methane in the sealed area would have continued to trend upward and oxygen would have decreased until it passed through the explosive range. Using the regulatory agencies' data, that level would not have been achieved until January 22, 2006, a total of 42 days from the completion of the seals. This would have permitted an explosive methane-air mixture to exist in the sealed area for about 28 days (trending graph attached as Appendix 15).

UMWA RECOMMENDATIONS

1. Seals in worked-out or abandoned areas of the mine should be visually inspected and tested each shift with an approved methane detector to insure their structural integrity and to check for methane leakage.
2. Seals that do not pass this inspection must be immediately leak-tested utilizing the same methodology currently used for this purpose at NIOSH's Lake Lynn experimental mine. Any leaks or damage to the seal must be repaired immediately.
3. Adequate rock dusting of the area prior to sealing must be required. Operators must be required to bulk dust each entry and crosscut prior to the start of the sealing process. The final seals should not be installed until the area is inspected and the agencies are satisfied the area has been sufficiently rock dusted.
4. The agencies should consider future sealing methods that require approval of smaller, more manageable areas of the mine. These smaller sequentially sealed areas will eliminate large areas where enormous volumes of explosive gases can accumulate, allowing better control within the area. Successively sealing these areas will afford additional protections to miners.
5. The agencies should not approve ventilation plans that utilize blowing ventilation where active working areas are inby.

UMWA Finding on Second Mining

The mine operator submitted and MSHA approved a plan at the Sago mine to conduct second mining. Second mining is so unusual that many people in the industry are unaware of its practice. The Sago mine is located in an area where the upper and lower benches of the Kittanning Coal seam are located in close proximity to each other. The lower bench lies directly underneath the upper bench and is separated by a binder that ranges from 1-1/2 to 10 feet thick. The upper bench, which varies in thickness from six to nine feet, is mined while the sections are advancing. When advance mining ceases, the binder between the coal benches is removed and the lower coal bench is mined.

This process creates areas in the mine where the distance from the mine roof to the floor can be several times higher than when advance mining occurred. This second mining at Sago created entry heights in excess of 18 feet in many areas. This practice increased the hazards associated with roof falls and rib rolls.

The practice also created a unique problem in the sealed area of the mine. The height of the entries

permitted methane to accumulate in the area at volumes much greater than would normally be the case. When the methane in this area was ignited, the forces from the explosion compressed as they radiated outward into the entries that were not part of the second mining. This compression, commonly referred to as "piling," increased the magnitude of the forces, creating much greater-than-normal pressure from the original explosion.

The pressures that struck the seals from the blast at the Sago mine, though yet undetermined, were in excess of what investigators had witnessed at other similar events. There is no doubt that this "piling" contributed to the extensive damage underground.

UMWA RECOMMENDATION:

1. The practice of second mining should not be approved.

UMWA Findings on Forces

The explosion in the sealed area produced heat and extreme forces. These factors pulverized nine of the ten Omega Block seals. The remaining seal, located in the #1 entry, failed catastrophically.

UMWA RECOMMENDATIONS

1. The Union calls for the immediate and permanent ban on the use of all Omega or similar-type blocks and material in any underground area of all coal mines.
2. MSHA should rescind its regulation that permits alternative materials and methods for constructing seals, and immediately require that all seals be explosion-proof seals or bulkheads, as is required by Section 303(y)(2) and (3) of the Federal Mine Safety and Health Act of 1977.
3. The Union believes the current protocol used for testing and approving seals is flawed. The National Institute of Occupational Safety and Health (NIOSH) recently issued a draft report entitled "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines." The report addresses two critical issues:
   a. What explosion pressures can develop during an explosion within a sealed area, and
   b. What are the appropriate design criteria for seals that will withstand these pressures?

   The UMWA recommends that MSHA promulgate a regulation that would require the construction of seals that meet the mandates of Congress outlined in the 1977 Mine Act and the recent recommendations of NIOSH's draft report on mine seals.

UMWA Findings on the Escape Attempt of 2nd Left Parallel Section Crew

The ventilation plan submitted by the operator and approved by the agencies after the completion of the 2nd Left Mains seals was inadequate. The intake air coursed up the #9 entry and then split to ventilate the seals as well as the 2nd Left Parallel Section, placing miners at great risk. The only safety protection offered to miners from contaminated air entering the Section once the seals failed following the explosion were a few ventilation controls. These controls were not designed to withstand even the limited pressures MSHA requires for seals.

The ventilation controls were immediately compromised by the explosion, and the blowing-type ventilation system pushed the contaminated air directly into the Section. This ventilation scheme compromised the miners' escape route. MSHA headquarters must stop its current practice of approving plans based on industry-wide standards. The unique conditions of each mine must be assessed by the appropriate MSHA District Office and a determination to approve or deny a plan should be made at the District level.

Based on our investigation, the Union determined that the miners in 2nd Left Parallel Section, with their 245 collective years of experience, performed as a cohesive group, with a good understanding of appropriate emergency response. Immediately after the explosion, the crew gathered themselves together and went to the mantrip. They attempted their first escape, but were stopped by debris on the track and zero visibility. They exited the mantrip and immediately entered the intake escapeway, where they donned their SCSRs. Evidence in the mine indicates they then attempted to exit the mine

in the intake escapeway, but because of the design of the ventilation system, the gases and smoke from the explosion continued to be forced directly into their faces. The crew then moved inby to the face area and, as they were instructed in their training, barricaded themselves in an isolated location and prepared for rescue.

UMWA RECOMMENDATIONS

1. Mine ventilation systems must be designed to offer miners the greatest possible protection to enhance their ability to escape. Air used to ventilate seals must be coursed away from working sections, and immediately to the return. This is necessary to insure that the integrity of the intake escapeways are not compromised.
2. All mandoors must be clearly marked on both sides.

UMWA Findings on Destruction of Infrastructure

The forces of the explosion in the 2nd Left Mains Section traveled into both active working sections. These forces destroyed the communication system and ventilation controls.

UMWA RECOMMENDATIONS

1. Current communication systems must be hardened (reinforced to withstand the forces of an explosion) to increase their survivability.
2. A second (redundant) communication system, independent of the mine's current primary system, must be installed in a separate isolated entry. This second communication system must run from the surface to additional phones completely separate from the phones currently underground and must be hardened to increase survivability.
3. Current communication technology, including one-way text messaging and two-way wireless systems, must be immediately installed in all mines. Any system that can increase the ability for miners to escape a mine emergency, even if it is limited in scope, must be utilized.
4. MSHA must be required to pursue new technologies that will increase the effectiveness of wireless two-way communication in underground mines. As new technology becomes available, mine operators must be required to install it in all their operations.
5. MSHA and NIOSH must be mandated to fund and direct continued studies and research to develop a new generation of wireless communications technology.
6. Flame-resistant reflective directional lifelines must be required from the face areas in both the primary and secondary escapeways. These lifelines should direct miners from their workplace to the nearest surface escape, shaft, slope or capsule.
7. Tethers for linking miners together when necessary during escape should be available in every section at the inby end of the lifeline. They should be of sufficient length to eliminate the possibility that miners will become entangled while they are walking or crawling to safety. Additional tethers should be located at strategic locations throughout the mine.

UMWA Findings on Donning and Use of SCSRs

With all their escape routes cut off and left with no other alternatives, as a last resort the crew returned to the face area to barricade. Randall McCloy, Jr., reported that soon after donning their self-rescuers, four of the miners could not get their units to function properly. He testified that they tried several times over the next few hours to activate the devices, by both turning the brass valve to start the "candle" and manually breathing into them, but neither method proved effective.

UMWA RECOMMENDATIONS

1. Additional oxygen devices must be readily available where miners are working to ensure there is an adequate supply to begin an escape in an emergency situation. Oxygen must be available for all miners to effectively escape from the deepest penetration of the mine to the surface.
2. Additional oxygen devices in protective cases must be stored at strategic locations in both the primary and secondary escapeways for miners

to access as they travel out of the mine. These caches must be placed at a distance not to exceed 30 minutes normal walking distance.

3. Flame-resistant directional reflective lifelines must intersect every oxygen storage location in the escapeway.

4. SCSR storage caches should include a communication system to the surface, first aid supplies and tethers as well as oxygen.

5. SCSRs currently deployed in the nation's coal mines must be immediately subjected to random testing to ensure they are working effectively. MSHA, with the assistance of NIOSH, should immediately begin a random testing of all units currently deployed in the field.

6. MSHA, with the assistance of NIOSH, should conduct a mandatory random sampling of all SCSRs deployed in the field annually. The annual sample size should be no less than three percent of all units deployed in the industry.

7. The cost of SCSR replacement units selected for testing must be borne by the mine operator as a normal cost of business.

8. The test protocol for approval of SCSRs must be reevaluated and changed to ensure the adequacy and duration of the units. Testing of devices must take into consideration the temperature, age or other condition that may affect the unit's performance

9. Shelf life of stored and carried SCSRs must be reevaluated and if necessary shortened, so that each unit can be relied upon to perform in an emergency.

10. Current SCSR technology is almost 20 years old. The federal and state governments, through MSHA and NIOSH, should actively pursue new SCSR technology. All stakeholders must be closely involved in the design, development and testing of these devices. The new generation of SCSRs must be longer-lasting, more reliable units that require single donning with dockable oxygen canisters. This will eliminate the chance of breathing contaminated irrespirable air when changing units.

11. New SCSRs should be positive-pressure units with full face masks.

12. Training for SCSR donning and escape must be wholly separate from all other types of training miners currently receive. This training must be repeated every 90 days.

13. SCSR and escape training must be done in actual conditions underground and, to the extent possible, reflect real-life emergency situations. Miners must don the SCSR training model and walk at least a portion of the escapeway. The training model must duplicate the characteristics of the working units, including restrictive breathing and heating. The Union opposes the practice of co-mingling or mixing different SCSRs at a single operation.

UMWA Findings on Barricading and Tracking Devices

The 2nd Left Parallel Crew completed a barricade in the face of #3 entry. They then followed correct barricade protocol to signal rescuers, but no rescue was facilitated.

Barricade procedures are taught to all miners in their initial and annual retraining. While barricading has proven to be effective in a few instances, had tracking devices been available they may have facilitated the rescue of the miners. Unfortunately, requiring this technology has never been a priority for the agencies, nor of interest to the industry.

UMWA RECOMMENDATIONS

1. Tracking devices that can identify the location of miners at all times underground must be required at all operations. Such technology is currently available and MSHA must require mine operators to provide these devises to all miners working underground. Any system that can increase the ability for miners to escape a mine emergency, even if it is limited in scope, must be utilized.

2. MSHA and NIOSH must be mandated to fund and continue to pursue technology to greatly increase the capabilities of wireless tracking devices. The goal of the agencies must be to cre-

ate a unit that will allow pre- and post-accident tracking of all miners underground.

3. MSHA and NIOSH must update and test new, easily deployable, reliable and accurate seismic-type devices to locate trapped miners. At least one of these devices should be maintained in each MSHA District office.

   In the event the agencies do not move forward with this recommendation, the Union demands miners be informed that, when barricading, their signaling will not likely be detected on the surface.

4. "Safety chambers" and "safe havens" should be required in all mining operations. The Union notes that these are two distinct systems and they cannot be used interchangeably.

   Each operator must be required to submit a plan that dramatically increases the possibility of survival of miners who are unable to escape an emergency situation. The plan must include the use of both safety chambers and safe havens.

   Safety chambers must be explosion-and fire-resistant, mobile either by means of track wheels or skids and be located no further than 600 feet from the nearest working face of the section in the intake entry. The location of all safety chambers in the mine must be noted on the mine map on the surface. Additional chambers must be located at strategic locations throughout the mine to accommodate outby workers or miners who become trapped during an evacuation attempt. Lifelines from working areas of the mine must intersect each additional chamber in the escape route. The chamber must contain sufficient supplies to sustain the lives of all miners who may have to access it for a period of not less than five full days. The chamber must contain:

   a. adequate oxygen to sustain trapped miners;

   b. first aid supplies to deal with injuries that could be sustained in an emergency;

   c. potable drinking water sufficient to allow one gallon per person per day;

   d. food sufficient to sustain miners in a healthy condition for five days;

   e. sanitary facilities to accommodate trapped miners for the duration of the event;

   f. a separate communications line located in a separate isolated entry, or through a borehole from the surface to the chamber;

   g. devices to monitor the mine atmosphere outside the chamber at all times;

   h. an alarming device that indicates to the mine rescue team that miners have entered the chamber;

   i. activities that will allow miners to avoid, to the extent possible, stress and panic; and

   j. other life-saving or life-sustaining technology that becomes available in the future.

   Training on when to access the chamber and how to utilize its life-saving equipment will be essential to enhancing miners' health and safety. This training must be separate from the current annual retraining under Part 48. It must be comprehensive and frequent to be successful. The Union recommends that it be done at least every six months and should coincide with the emergency response plan review by the Secretary.

   MSHA must drive the industry to improve technology and to require the use of these devices in the nation's mines. Any Program Policy Letter (PPL) or any future rules must be prescriptive in nature, demanding mine operators be proactive to enhance miners' health and safety on a continuous basis, including the use of safety chambers.

   Safe Havens are relatively permanent structures of the mine. The location of all safe havens in the mine must be noted on the mine map on the surface. They must be designed to offer protection and temporary sanctuary to miners as they exit the mine during an emergency. These areas would contain many of the same items required in the safety chambers, but are not designed for the same purpose.

   Rather, they would be a temporary stop to establish communication with the surface, refresh the miners' oxygen supply and offer help to those in need of first aid before continuing to the surface.

The safe haven itself must be constructed of explosion-proof bulkhead seals with submarine type doors for access from either side. The area inside the seals must be ventilated with positive pressure from a surface borehole and with a separate communication line to the surface. Directional lifelines from the working areas of the mine or other inby safe havens or safety chambers must intersect each additional safe haven in the escape route.

UMWA Findings on Notification of Regulatory Agencies and Mine Rescue

The first call from the Sago mine notifying the regulatory agencies or rescue personnel occurred at about 7:20 am. The calls made approximately 50 minutes after the explosion to MSHA, WVOMHST and Barbour County Mine Rescue initially went unanswered. The necessary information was finally passed between the parties when phone messages were returned or additional calls were made.

UMWA RECOMMENDATIONS

1. Mine management must be required to contact the proper regulatory authorities and the mine rescue teams for their operation immediately, but at least within 15 minutes of the onset of the emergency. The operator should have enough responsible people physically on the mine site or immediately available by phone to handle these duties without delay.

   It is the Union's position that the 15-minute notification should not be interpreted to permit an operator an excessive amount of time to assess an emergency. This would only serve to delay rescue and recovery operations.

2. MSHA must create a Mine Emergency Response Office (MERO) within the Agency. The MERO must be staffed 24 hours a day, seven days a week, by experienced full-time MSHA employees with extensive mining knowledge. Emergency contact to MSHA by mine management personnel should be available using a toll-free phone number.

3. The federal and state agencies should be responsible for immediately notifying and deploying all government rescue personnel, equipment and other necessary assets to the mine site after being notified that an emergency situation exists.

4. Every effort should be made to coordinate the emergency response of the federal, state and local agencies.

5. Mine rescue teams required to be first responders must be notified immediately, but at least within 15 minutes of the onset of an emergency. This notice should be made by mine management personnel immediately after notifying the regulatory agency.

6. Mine management must ensure that appropriate arrangements have been made to guarantee their designated mine rescue teams are available 24 hours a day, seven days a week, to cover any situation that may require their services.

7. Two (2) mine rescue teams designated as first responders must be employees of the mining company who routinely train together at the affected mine, but under no circumstance less than four times per year. These teams must be readily available at all times when miners are underground.

   As additional mine rescue teams are needed, they should be from the operations nearest the affected mine. Under no circumstances should a contract or composite mine rescue team be permitted.

UMWA Findings on the Failure to Secure Evidence and Control the Mine Site

The scene on the surface at the Sago mine, even after the arrival of MSHA, the WVOMHST and ICG corporate officials, was chaotic. There appeared to be no one in charge, causing in some cases inaccurate information to be inappropriately disseminated beyond the confines of the command center and rescue teams. This confusion wasted valuable time and complicated rescue efforts.

ICG's first plan was not submitted to the agencies for approval until 1:00 pm, nearly 6-1/2 hours after the explosion. That plan only requested that gases at the pit mouth be monitored, a practice that had already been ongoing for several hours.

It was not until several hours later that ICG submitted a plan requesting the Tri-State A Mine Rescue Team—a contract team—be permitted to enter the mine and begin rescue activities. The plan was later modified to have the more experienced Consol Energy Robinson Run Rescue Team enter the mine first; however, that did not occur until about 5:10 pm, over 10-1/2 hours after the explosion, already too late for some of the miners.

Also, the regulatory agencies have many responsibilities with regard to mine emergencies, including requiring that the operator secure the mine site and manage the accident scene. They failed to adequately fulfill these responsibilities.

Further, it is the responsibility of MSHA to secure evidence obtained during the investigation of any serious non-fatal accident, fatal accident or disaster. This evidence must be immediately recorded and a chain of custody established to ensure it is not tampered with by any individual(s).

During the Sago investigation a pump and pump cable were discovered in the sealed area and retrieved by the WVOMHST. They were removed from the mine and placed on the surface. The equipment was allowed to remain on Sago mine property unattended for several days before government personnel transported it to a federal facility for testing. This break in the chain of custody renders the pump and pump cable unreliable as evidence. Test performed on the unsecured equipment is not credible and will not withstand reasonable scrutiny in the court of public opinion, let alone a court of law.

UMWA RECOMMENDATIONS

1. MSHA must take immediate control of all aspects of the rescue and recovery. It must create plans and implement them to facilitate the immediate use of all mine rescue assets as soon as possible. MSHA should exercise the authority mandated by Congress and not delay before implementing a plan to safely enter the mine and facilitate rescue activity.
2. Representatives of the miners must be afforded full rights to participate in all aspects of the rescue and recovery operations and the subsequent accident investigation.
3. The mine operator must be on-site to provide logistical and general mine information necessary to facilitate rescue and recovery operations.
4. The federal and state regulatory agencies must secure the surface area of the mine and limit access by individuals who have no right to enter the property or are not involved in the rescue efforts. This will ensure rescue teams, fire crews, police, miners' representatives and other necessary personnel understand their roles in the disaster response and are not delayed in beginning the rescue effort.
5. Communications with family members, the press and general public should be handled by an independent arm of the federal government, much like the National Transportation Safety Board (NTSB) and Surface Transportation Board (STB) do with air, rail or highway incidents. They should also make necessary arrangements for family members as they arrive at the site. These requirements should be specifically laid out in the mine emergency response plan.
6. Information from the command center to any sources not immediately involved in the rescue efforts should be carefully monitored and verified to ensure accuracy. In the event miscommunications occur, they must be immediately corrected.
7. All mobile equipment entering the mine during rescue and recovery efforts must be equipped with two- way communications.
8. All evidence or materials that may become part of the official investigation must be secured immediately by MSHA.
9. MSHA must establish a rigid chain of custody for all evidence and see that it is followed to ensure accurate and credible results are obtained during testing procedures.

UMWA Findings on National Mine Rescue Preparedness

Given the demands on the current mine rescue preparedness system, it is questionable how much longer it can be expected to function at its current level. The industry and agencies have known for years that the number of experienced mine rescue teams was

continually decreasing, placing ever-greater pressure on those remaining. Many of these teams are made up of highly skilled and motivated individuals who offer their expertise and experience to help miners who are in dire need of assistance. With fewer teams covering an expanding industry, the need for teams to work longer hours in difficult conditions places them at unnecessary risk.

MSHA policy has further eroded the number of mine rescue teams. Permitting mine operators to create unrealistic schemes to cover their mines in the event of an emergency has served to undermine the program. Well-established mine rescue teams train together and participate in mine rescue contests which are supervised and evaluated by the regulatory agencies. This establishes a continuity that leads to a more effective and successful rescue and recovery operation. Most composite and contract teams do not do any of the above, which makes them, at times, ineffective. MSHA must require realistic training that simulates mine emergencies for all mine rescue teams.

Many mine operators consider mine rescue teams a drain on their financial resources rather than a safety enhancement. They refuse to maintain their own teams because they see this practice as an excessive cost rather than a safety protection. They associate rescue team training, and the purchase and maintenance of equipment, simply as a loss of man-hours and profits. This gives companies who refuse to participate in this important process an unfair competitive advantage over other operators.

MSHA's current policy regarding mine rescue teams should be rescinded immediately.

UMWA RECOMMENDATIONS

1. Steps must be taken immediately to significantly increase the number of qualified mine rescue teams nationwide.
2. MSHA should immediately require all mine operators to have two rescue teams readily available at all times when miners are underground. These teams should be made up of miners working at the operation who are familiar with the mine layout and conditions and those team members must perform all required training together.
3. Training for mine rescue teams should be required frequently, but at least every quarter (three months). Training should be done at each mine the rescue team is charged with covering. This will require surface as well as underground exercises to ensure the team members are familiar with the facility.
4. Mine rescue teams should be certified by MSHA to ensure competence. Certification should be directly tied to the team's demonstrating proficiency and skill in all aspects of mine rescue. Teams that do not pass the certification may continue to practice, but shall not be permitted to perform any actual mine rescue.
5. All mine rescue teams should be required to participate in at least two mine rescue contests every year. Failure to participate must result in the team's certification being revoked.
6. Composite and contract mine rescue teams should not be permitted under any circumstances.
7. A member of the mine rescue team actively working in a mine or acting as backup should be immediately available when requested in the command center.
8. The agencies must immediately take enforcement action against any operator that does not comply with the mine rescue team requirements. This action should include issuance of a closure order that stops production at all affected operations. Facilities so affected should not be permitted to resume operations until all aspects of the mine rescue team requirements are met.

UMWA Findings about MSHA

The UMWA has become increasingly concerned in recent years with the direction of MSHA as a regulatory agency. In 1969 and again in 1977, the U.S. Congress assessed the conditions in the coal industry and determined that mine operators were unable to self-regulate. It decided that having statutory language and strictly enforced regulations were the only way to ensure the lives of miners would be protected.

There has been a marked shift in MSHA's priorities from enforcing health and safety regulations

to "compliance assistance." MSHA has become unduly concerned with the expense that regulations may have on the operators' bottom line. In some instances, it actively pursues and promulgates regulations operators want that increase production even when they decrease health and safety. The regulation allowing the use of belt air is but one example.

MSHA has greatly expanded its compliance assistance program to get along with the operators, while enforcement activity has taken a back seat. The number of coal mine inspectors has reached an historically low level, although that issue is being addressed thanks to the efforts of Senator Byrd, who led the charge to appropriate $25.6 million in supplemental funding to train 170 additional coal mine inspectors.

The Mine Act and MSHA were created as a result of numerous tragedies in the coalfields. For years, the Agency has come under the influence of operator interests, run by men and women from the highest levels of industry. This is not what Congress intended.

UMWA RECOMMENDATIONS

1. MSHA must re-establish itself as the government's advocate for miners.
2. MSHA must immediately hire and train a sufficient number of inspectors to fill vacant positions and better prepare for the retirement of its aging workforce.
3. Former coal industry executives should not be permitted to hold the highest offices within MSHA.
4. Future regulations must focus first on the health and safety benefits they afford miners. Considerations regarding cost benefits should not in any way negatively impact the protections miners enjoy.
5. In addition to the recommendations already made in this report and the MINER Act, MSHA must immediately take the following actions:
    - Repeal the belt-air regulation;
    - Require flame resistant conveyor belts in all mines;
    - Move to increase the number and skill level of mine rescue teams;
    - Lower the maximum exposure limit for respirable coal mine dust and silica;
    - Update and expand training and retraining of miners;
    - Develop a public hearing- style investigation process;
    - Update the penalty and assessment scheme;
    - Modify the conferencing process;
    - Improve the certification and approval process;
    - Assist NIOSH in developing the next generation SCSRs;
    - Update permissible exposure limits for contaminants in the mine environment;
    - Improve atmospheric monitoring systems;
    - Develop a nationwide emergency communications system;
    - Develop air quality, chemical substances and respiratory protection standards; and
    - Address issues related to working in confined spaces.

The UMWA made many of these same recommendations after the September 23, 2001, Jim Walter #5 disaster. Had they been implemented, the events at Sago, Alma and Darby may have been avoided. MSHA has a responsibility to move forward with these recommendations immediately. The United Mine Workers of America and the nation do not intend to see more miners die as a result of regulatory inaction at any level of the government.

Events of January 2, 2006

Prior to preshift examination

On Tuesday, January 2, 2006, three individuals arrived at the Sago mine to perform their required duties prior to the start of production by the dayshift crews. Fred Jamison, beltman and outby fireboss, and Terry Helms (victim), beltmen and fireboss, arrived to perform the preshift examination of the underground areas of the mine. William Chisolm, dispatcher, was the responsible person on the surface.

The testimony of Jamison (*January 17, 2006*) and Chisolm (*February 15, 2006*) to the Mine Safety and Health Administration (MSHA) and the West Virginia Office of Miners' Health Safety and Training (WVOMHST) conflict in several areas. The most notable difference between the testimony is in regard to the time at which certain events took place on the morning of January 2, 2006.

Jamison testified when asked what time he arrived at the mine that, "It was probably a quarter after 2:00 am." (*Jamison page 22 at line 23*) Further, he testified in response to a question about what time he entered the mine that, "It was close to three o'clock…" (*page 48 at line 19*)

Chisolm testified that, "I arrived at the mine site probably 3:30 because Fred Jamison and Terry Helms had to go under and fireboss, so I had to be there in time to start by 4:00." (*Chisolm page 29 at line 2*) Further, he testified that, "My usual shift is 6:00 in the morning till 6:00 in the afternoon. I was to come in at 4:00 in the morning so the firebosses could go under, and then continue working my shift." *(Chisolm page 41 at line 2)*

However, both Jamison and Chisolm reported they had spoken to one another before the fireboss run began. Chisolm also testified that he had a conversation with Helms prior to his entering the mine to begin his preshift examination.

Considering the layout of the mine, the duties each fireboss was assigned to perform and the distance they would be required to travel, these discrepancies can be crucial in determining the events leading up to the explosion. At the time this report was written, the timing discrepancy could not be resolved.

Preshift examination

[Note: for clarity, this section of the report relies on times noted by Fred Jamison, but does not concede their accuracy.]

Fred Jamison arrived at the mine and reported to the bathhouse at approximately 2:15 am and began changing into his work clothes for the start of his shift. Terry Helms arrived shortly after Jamison, and the two discussed what areas of the mine each would examine. Helms told Jamison they would be doing their regular fireboss runs. Jamison's normal examinations included numbers 1, 2 and 3 track and belt. The two then proceeded to the foreman's room to review and countersign the preshift examination books. Helms went out to talk with William Chisolm, Dispatcher, then he and Jamison went down the hill into the pit to get a mantrip.

Helms and Jamison rode into the mine to the first derail switch. Jamison threw the derail, crossed over the track and walked inby in the belt entry. He reached 11 block and heard Helms approaching in the mantrip. He entered the track entry, opened the airlock door, threw the second derail switch and got into the mantrip with Helms and the two proceeded to the No. 3 belt drive. Jamison exited the mantrip at No. 3 belt drive and began walking the belt entry inby towards No. 4 belt drive. During the examination he noticed that a pump at 22 block of No. 3 belt was not operating. The breaker would not reset, so he continued up the belt entry. Helms continued to travel inby to examine 1 Left Section. Prior to leaving, he asked Jamison to

examine 2nd Left Parallel Section for him. (Jamison does not normally fireboss face areas of the mine. He reported this was only the second time he firebossed a working section at this operation.)

Jamison arrived at No. 4 belt drive, exited onto the track and took the mantrip Helms left at 1st Left switch to the 2nd Left Parallel Section. Jamison arrived at 2nd Left Parallel at approximately 4:00 am, parked the mantrip at the switch and walked the belt entry into the Section. He entered the Section and crossed into #1 entry, finding no methane and 11, 241 cubic feet per minute of air. He ran all the faces 1 through 8 and found nothing to report. Jamison exited the Section in the track entry and examined the Section power center and charging station.

At the mouth of 2nd Left Parallel, Jamison took the mantrip to 1st left. He called outside to Chisolm and told him he was leaving Helm's bucket and coat at the 2nd Left Parallel Switch. He proceeded to 22 block of the No. 3 belt and attempted to reset the pump again. He was unable to do so and continued to the outside. Jamison told investigators that he recorded this problem on his note pad and informed John Boni, the pumper, when he was on the surface. The note book he refers to has not been found. Jamison arrived on the surface sometime between 5:30 am and 5:40 am and placed the mantrip on charge.

Jamison filled out the 2nd Left Parallel preshift book on the surface, indicating that nothing unusual was found. He also reported talking with the oncoming 2nd Left Parallel Section foreman Martin Toler, telling him that, "The section looked good and...your miner is in number one." *(Jamison page 96 at line 4)* Toler countersigned the preshift report.

Jamison then signed the belt/track preshift book. It specifically noted that Nos. 1-3 track and 1-3 belt were clear. It also noted that Nos. 4, 5 and 6 track were clear. The report stated that areas of Nos. 4, 5, and 6 belts needed rock dust and that No. 7 belt had a water accumulation that needed to be pumped at 20 block. The preshift examination report for Nos. 1, 2 and 3 track as well as Nos. 4, 5 and 6 belt were reported by Terry Helms to John Boni, as was the practice at the mine. Boni would record all the track and belt preshift examinations in the appropriate record book and the examiners would sign the reports at the end of their shift.

On January 2, 2006, Jamison went to the surface prior to the start of the production shift and signed for his examination. It must be assumed that Helms would sign at the end of the shift as he had in the past.

There is no way to corroborate the times stated by Jamison. The dispatcher's report kept on the surface contained insufficient information.

Indications are that Helms completed the preshift examination of 1st Left Section at approximately 4:50 am. He walked to the mouth of the Section, picked up his bucket and walked to 2nd Left Parallel belt drive to complete his preshift examination.

Sometime after 5:00 am, Helms called outside to Owen Jones, 1st Left Section foreman, to report his findings. The evidence shows that: Helms reported that 1st Left Section and charger were safe at the time of the examination, between 4:20 and 4:50 am; he also informed Jones that #2 and #3 entries were not bolted, and 5, 6 and 7 entries needed to be cleaned.

The report does not indicate what time the call was received on the surface; however, Jones stated he did not arrive at the mine until after 5:00 am. There is no way to determine the time Helms made his report. Jones did not record the time on the preshift report and it is not clarified in his testimony. Helms also relayed the belt/track preshift examination report to John Boni at about the same time.

Start of production shift to time of explosion

Shortly before 6:00 am, Owen Jones and his brother Jesse Jones, roof bolter operator (victim), proceeded to the pit and began preparing mantrips for entry into the mine.

The 2nd Left Parallel crew loaded up in the first mantrip and entered the mine at about 5:55 am. It was the practice at the mine to have the 2nd Left Parallel crew enter first because they were the inby Section.

The crew traveled to the 2nd Left Parallel Section, exited the mantrip, and began their normal routine.

Fred Jamison completed his paperwork on the surface and re-entered the mine after the 2nd Left Parallel mantrip departed, at approximately 6:00 am.

The 1st Left crew was delayed entering the mine because the mantrip was not large enough to carry everyone. The trip was switched out and the crew entered the mine on a larger mantrip at approximately 6:05 am, about 10 minutes behind the 2nd Left Parallel crew.

The mantrip proceeded to 1st Right pumper shanty and John Boni exited the trip. The crew continued inby to No. 4 belt drive, where Pat Boni exited the trip and entered the No. 4 belt drive.

The production crew continued inby to the 1st Left switch. Roger Perry, miner operator, got off the mantrip and threw the track switch towards the Section. Perry returned to the mantrip and, immediately upon his sitting down, the explosion occurred. At this time, 29 miners were underground in the mine in various locations.

The explosion and its effects

The explosion was initiated behind the newly-constructed Omega Block seals and blew outward in all directions from its epicenter. No one can conclusively determine the exact point of origin of the explosion. However, based on the damage, it is clear that the sealed area contained sufficient gases to propagate the forces of the explosion a great distance and with extreme force.

The pressure forces (both static and dynamic) and the heat from the blast struck the inby sides of the Omega Block seals, pushing them outward into the active area of the mine. These forces were so great that nine of the seals were completely obliterated. The remaining seal, located in the #1 entry, suffered catastrophic failure and was blown against an adjacent rib-line.

The forces traveled into the 2 North Mains area of the mine outby in the sealed area, destroying communications and ventilation controls up to at least 42 block. The forces also traveled into the 2nd Left Parallel Section, destroying communication and ventilation controls. Dust and noxious gases were immediately present in virtually every area of the mine from 37 block of No. 4 belt inby.

Evacuation of mine and initial rescue attempt

FROM 1ST LEFT SECTION OUTBY

The forces of the explosion struck the mantrip carrying the 1st Left crew, immediately engulfing them in smoke and dust. Debris swept up in the blast also struck the mantrip. Owen Jones, section foreman, attempted to operate the mantrip but was blown out of the seat by the forces of the explosion. The forces were so strong he noted that, "...I'm standing there and it's pushing me forward. It's making me walk. And I'm thinking it's absolutely going to pick me up and throw me, I mean, and then it quits." *(Jones page 23 at line 1)*

The 13-member crew immediately exited the mantrip, gathered on the outby end and started down the track toward the entrance of the mine. The dust was so thick, Jones recalls, that, "...You can't even see the ground. You can't even see your feet. We're following the track the best we can down through there..." *(Jones page 23 at line 17)* They continued to follow the track entry to 37 block of No. 4 belt, where a mine phone was located. Jones called outside to the dispatcher and reported that, "...We've had something happen in the mine, an explosion or something, I said, get the people in here..." *(Jones page 26 at line 2)*

Jones remained at the phone. The rest of the crew left the track though a mandoor, traveled across #7 entry through a second mandoor, and entered the #8 intake escapeway entry. As the twelve miners continued to travel outby in the intake escapeway, Ron Grall and Paul Avington moved ahead of the group.

The remaining ten miners continued to follow the escapeway entering #9 entry at 31 block. They proceeded to travel outby to 27 block when they heard a mantrip approach. They exited the escapeway through mandoors at that location and entered the track heading. A mantrip carrying Jeff Toler, Superintendent; Al Schoonover, Safety Director; Ernest Hofer, Maintenance Foreman; Denver Wilfong, Maintenance Superintendent; and John Boni stopped when they encountered the crew. Wilfong, Boni and Hofer were instructed to take the crew out of the mine. Toler and Schoonover remained underground to assess the situation.

The mantrip proceeded in an outby direction until it reached 9 block of No. 4 belt, where they encountered Grall and Avington. The two miners got onto the mantrip and it continued to exit the mine, arriving on the surface at approximately 7:30 am.

The two other miners who entered the mine at the beginning of the shift also exited the mine safely. Jamison exited in the track entry and Pat Boni walked out the escapeway. At that time Toler, Schoonover and Jones were the only men underground outby the 2nd Left area of the mine.

After gathering supplies on the surface, Wilfong and Hofer boarded the mantrip and headed back underground. They met Toler, Schoonover and Jones at 32 block in the track heading. The stopping at this location was damaged, and they repaired it using brattice cloth.

The trip proceeded inby with all five miners repairing stoppings as they went until they reached 42 block and stopped when their handheld gas detectors alarmed, indicating the presence of carbon monoxide.

The mine atmosphere was unstable, so they decided to disconnect the batteries in the mantrip because they presented an ignition source. They then proceeded inby on foot. They repaired damaged ventilation controls between the #6 and #7 entries at crosscuts 42, 43, 45, 46 and 47. Toler traveled through the damaged brattice wall at crosscut 49 across the track entry and retrieved a phone from the 1st Left belt head; he noticed a reading of 700 ppm CO on the track.

Toler extended the phone line and brought some first aid supplies into the crosscut between #6 and #7 entry; they then continued inby after repairing the wall at 49 block. The crew moved inby and repaired damaged ventilation controls at crosscuts 51, 54 and 55. They noticed that the smoke and CO did not dissipate as quickly as it had been and they became concerned that they had missed some damaged ventilation controls along the way. Toler asked Jones and Hofer to take a roll of brattice cloth and check the outby stoppings.

The other three (Toler, Schoonover and Wilfong) advanced to 57 block and hung a curtain in the crosscut. They moved to 58 block and noticed the smoke was extremely dense. Toler noted, "... It seemed that the smoke was just kind of swirling, that it wasn't wanting to dissipate." *(Toler page 36 at line 2)* The three discussed the possibility that they may be pushing fresh air into an ignition source and cause another explosion. They remained in the area for some time trying to contact the 2nd Left Parallel crew, but got no response.

They finally decided they had gone as far as possible under the circumstances and they should retreat from the area. Toler stated that they "...Probably needed to back out and let the professionals come in, the people that were trained in this." *(Toler page 37 at line 8)* They walked outby to crosscut 49 where Toler had moved the phone previously, called the surface and notified the dispatcher of their decision to exit the mine. They walked down the intake escapeway and caught up with Jones and Hofer around 2 Right; they all proceeded out of the mine, reaching the surface at approximately 10:35 am.

The 12 members of the 2nd Left Parallel crew and mine examiner/beltman Terry Helms were the only miners left underground. There had been no contact with them since approximately 5:55 am when they entered the mine.

Evacuation attempt/rescue and recovery

2ND LEFT PARALLEL SECTION

There is limited information on the activity that occurred on the 2nd Left Parallel Section in the hours immediately after the explosion. However, data collected during the investigation, and the testimony of Randall McCloy, Jr., indicate the following events occurred.

The crew felt the blast from the explosion as a strong gust of wind and the Section was immediately filled with dust and smoke. The severity of the blast had destroyed the Section communication system and severely damaged ventilation controls. While it is unclear how far miners in the Section had separated from one another at this point in time, soon after the explosion they all came together and boarded the mantrip in an attempt to exit the Section. As they moved down the track heading, they encountered

thicker smoke and dusty conditions. The mantrip was stopped by debris on the track at 10 block.

The crew exited the mantrip and walked in the direction of the intake escapeway. There are conflicting reports about when the crew donned their Self-Contained Self-Rescuers (SCSRs), but it would appear from the discarded SCSR cases that they performed this task at around 11 block in #7 entry. McCloy reports that four of the units did not work despite repeated efforts to activate them.

Dust and smoke continued to enter the Section, and after attempting to exit the mine in the intake escapeway, the crew returned to the Section and entered the face of #3 entry. At this location, they built a barricade to isolate themselves from the dust and noxious gases. Two members of the crew made a second attempt to find a safe escape route, but were turned back by heavy smoke, gases and debris.

Over the course of the next several hours, members of the crew followed the standard procedures for barricaded miners, taking turns pounding on a roof bolt at their location. (A standard procedure in which miners are trained: pound several times on a roof bolt or waterline and wait for a response from the surface. Rescuers on the surface, hearing the miners, are to set off a shot to notify the trapped miners they have been heard.) No response was received by the barricaded miners because the seismic equipment had not been properly maintained by MSHA and therefore could not be deployed. Eleven of the trapped miners later succumbed to the poisonous mine atmosphere.

Regulatory action and rescue/recovery

Shortly after 6:35 am on January 2, 2006, supervisory personnel on the surface at the mine became aware that something catastrophic had occurred underground. They had received word from Owen Jones that, "We had...an explosion...get mine rescue team here." *(Jones page 55 at line 14)* Efforts to contact the regulatory agencies and mobilize the necessary mine rescue teams, emergency personnel and equipment should immediately have been put in motion, but were not.

At about 7:15 am, Johnny Stemple, Assistant Safety Director, was patched into the mine communication system to Jeff Toler. Toler explained the situation and told Stemple that, "Dick Wilfong recommended that we contact a mine rescue team…" *(Stemple page 30 at line 6)* Nearly 40 minutes had passed since Jones first recommended teams be contacted.

The first attempt by mine management to contact anyone outside of the mine was made at approximately 7:20 am when Stemple placed calls to the state and federal regulatory agencies. His initial calls were either not answered or went to answering machines. At 7:50 am John Collins, an inspector from the West Virginia Office of Miners' Health, Safety and Training (WVOMHST), returned the call from Stemple. After getting some information about the incident, Collins contacted Brian Mills, inspector-at-large for WVOMHST, and informed him of the situation. Collins then proceeded to the mine.

Stemple also tried to contact the Barbour County Mine Rescue Team, which was under contract with ICG to provide mine rescue services for the Sago mine. The call went unanswered: the rescue team's "24 hour" answering machine was turned off.

Inspector Collins arrived at the mine at about 8:15 am and discussed the situation with miners from the 1st Left crew. He asked that air readings be taken in the return entry and, based on the levels of CO, issued a control order. Meanwhile, Stemple contacted a member of the Barbour County Rescue Team at home and informed him of the situation.

At 8:30 am, Stemple reached Jim Satterfield, an inspector with MSHA. Satterfield issued a 103(k) order over the phone and informed Stemple that no one was to enter or do any work at the mine. There was no further contact with representatives of MSHA until approximately 10:30 am when Satterfield, Pat Vanover and Ron Postalwait arrived on mine property.

The Barbour County Rescue Teams arrived at the mine at 11:00 am and began preparations to enter the mine, but were placed on stand-by. MSHA contacted Consol Energy and requested it to mobilize its rescue teams and proceed immediately to the mine. ICG chartered a plane to bring its team from the Viper mine in Illinois.

At 1:00 pm, some 6-1/2 hours after the explosion, ICG submitted a plan to MSHA and WVOMHST to

continue to monitor gases at the pit mouth, though this was already being done.

The Union is unaware of any previous plans submitted by the company to this point. MSHA and WVOMHST approved the plan, and monitoring continued for several hours.

Finally, at 4:45 pm, a plan was submitted to send the Tri-State Team A underground to explore the first 1,000 feet inby the pit mouth. The team was required to separate the belt structure and rails one crosscut inby the pit mouth. They were also instructed to tie in three entries every 500 feet and take air readings. The plan was approved by the regulatory agencies.

However, before it could be implemented, a modification was requested to permit the more-experienced Consol Energy Robinson Run Team to enter instead of Tri-State. The plan modification was approved at 5:10 pm. The Robinson Run Team entered the mine's intake entry through the fan housing on the surface. The team continued to move methodically through the mine, taking air readings and assessing conditions. At 6:57 pm, water was reported to be accumulating in the return entry at 21 block. Progress was halted until a plan was submitted and approved to start the pump.

The agencies approved a plan to permit the use of battery mantrips to transport mine rescue teams in and out of the mine to block 17 of #3 belt. The teams advanced to 32 block by 8:50 pm. The track was separated in this area to prevent the possibility it would carry a charge into the mine, creating an ignition source. The Robinson Run Team advanced to 34 block and reported seeing a red light in the entry, which they were given permission to investigate. The light was identified as a CO monitor operating on a backup power supply. Because of the potential ignition source the CO monitor presented, all teams were instructed to exit the mine until it could be de-energized. At approximately the same time the light was detected, 2:45 am, a drill rig on the surface began drilling a borehole into the 2nd Left Parallel Section.

At 5:30 am, the borehole punched through into the 2nd Left Parallel Section approximately 300 feet from the face. Air samples indicated levels of CO at 1,300 ppm, or three times the maximum safe level for a one-hour exposure. The drill rig was shut down to listen for signs of life in the area. After about 10 minutes, the drill steel was struck in an attempt to signal the trapped miners, but there was no response.

Rescue teams reentered the mine at 6:30 am on January 3, 2006. At the same time, a camera was lowered through the borehole into the belt entry of the 2nd Left Parallel Section, about where the feeder was located. There was no sign of damage from the explosion at that location, indicating the blast was initiated outby the Section. There was also no indication that the trapped miners had barricaded.

From 7:00 to 8:00 am the rescue teams advanced to 31 block No. 4 belt when MSHA decided to use its V2 mine robot. The robot was offloaded at this location and advanced to 32 block, where it became disabled.

The teams continued to move inby and advanced into the 1st Left Section, a distance of six breaks at block 48. They then proceeded up the mains and established a fresh air base at 57 block, #4 belt. While some rescue team members secured the fresh air base, others explored the entries between 57 and 58 blocks. Ron Hixson, MSHA inspector, discovered a body lying across the track, subsequently identified as Terry Helms. Indications are that he was caught in the direct path of the blast.

The fresh air base was completed at 5:45 pm, and rescue teams began to move inby to take gas readings at the sealed area. The teams continued to advance forward, but did not realize until they called outside with their location and the results of their air readings that they had actually traveled inby the seal locations, at 62 block of the 2nd Left Mains. They retreated out of the area and examined all the headings across 2 North Mains, confirming that all the seals had been completely destroyed. The Omega Block seals had been struck with sufficient force to pulverize them. The damage was so extensive that team members did not realize that they had advanced into the 2nd North Mains Section.

The teams then advanced into the 2nd Left Parallel Section and discovered the ventilation controls from the mouth of the Section to 12 block in the primary intake escapeway were all damaged. They found the Section mantrip at 10 block, and determined the crew must have attempted escape, but were stopped

by debris on the track. At 8:00 pm, the rescuers found the discarded cases of twelve SCSRs in the intake escapeway at 11 block of #7 entry.

The process of exploration from the mouth of 2nd Left Parallel Section to just inby the location where the SCSR cases were discovered, about halfway to the faces, had taken rescuers nearly three hours. The determination was made that continuing at this slow pace was unacceptable, and a decision was made to break rescue team protocol and push immediately to the faces. The teams were instructed at about 11:00 pm to disregard normal procedure and advance inby immediately.

This decision stretched the already taxed communication system beyond its capacity and resulted in communication problems; nevertheless rescuers agreed with the decision to advance more quickly. By 11:40 pm, the McElroy Team had reached the faces and split in separate directions to explore each face. Jimmy Klug, McElroy team captain, and Bill Tucker, of WVOMHST, explored the left entries, while Hixson (MSHA) and McElroy team members Mike Clark and Jim Smith explored the right side entries.

As they advanced forward in the #3 entry, Klug and Tucker heard someone gasping for air. They immediately noticed a curtain hanging across the entry and pushed it to the side. The 12 miners were all at this location. Klug moved toward the gasping miner (Randall McCloy), pulling him away from another miner who had fallen on top of him. He immediately activated a CSE SR-100 SCSR and placed it into McCloy's mouth. However, because of the victim's shallow breathing the device could not be properly activated. Tucker stepped back into the entry and called to the other rescue team members that they had found the miners and needed help. In the excitement Tucker yelled out, "They're over here. They're over here and they're alive." *(Tucker page 27 at line 6)*

The message, largely incorrect and yet unverified, was relayed from location to location along the overstretched communications system. The message went outside to the command center and was almost immediately communicated across the mine property and to the families at the Sago Baptist Church.

In the 2nd Left Parallel Section, the initial excitement quickly turned to sadness, as Hixson, Smith and Clark arrived at #3 face and the rescue team examined all the trapped miners. It became obvious that there were no other survivors. Despite this reality, while Klug and others worked on the surviving miner, the remaining rescuers checked each of the other miners and confirmed they were deceased. Rescue workers relayed the new information back through the communications chain, but it is unclear how far the correct information was transmitted.

The rescuers arrived at the fresh air base at the mouth of 2nd Left Parallel Section with McCloy around 12:15 am. They immediately placed the mask of a Draeger BG-4 positive pressure breathing apparatus on him and fitted it to his face. When Klug reached the fresh air base with McCloy, he realized the original miscommunication, regarding the condition of the trapped miners, had never been corrected. He immediately went to the mine phone and contacted the command center and reported, "We got 11 items" *(Klug page 32 at line 2)* ("item" was a code for body that the teams were instructed to use at the request of ICG). The command center personnel did not comprehend the message and finally, after several attempts to make them understand the situation, Klug stated, "There's 11 deceased people." *(Klug page 32 at line 4)* The command center ordered everyone out of the mine.

McCloy was carried to the mouth of 1st Left Section and placed on a mantrip for transport to the surface. The mantrip was delayed when they encountered a motor pulling a supply car into the mine. The miners on the motor acting on the original incorrect information had entered the mine to assist in what they believed was a rescue effort. Mine rescue team members informed them of the situation in the Section and proceeded to the surface with McCloy, arriving at about 1:00 am. The officials at the command center had received news about the fatalities at approximately 12:30 am on January 4, 2006, but no one communicated it from there at that time. The families of the miners continued to celebrate at the church until about 2:45 am when they were informed by mining company officials of the tragic news.

The Viper Mine Rescue Team went back underground at 1:55 am with stethoscopes and body bags to reassess the condition of the miners and remove

them from the mine. The members of the team confirmed the information relayed earlier by Klug and began the task of identifying each miner and preparing them for transport. The rescue teams reached the surface with the bodies of the twelve miners at approximately 10:00 am, January 4, 2006.

The rescue and recovery efforts were completed nearly 52 hours after the explosion.

Mine Seal Requirements

Federal Coal Mine Safety and Health Act of 1969 (Coal Act), and

Federal Mine Safety and Health Act of 1977 (Mine Act)

Concerning ventilation, 30 USC § 863(z) requires that:

(2) When sealing [a mined out or abandoned area of the mine] is required, such sealing shall be made in an approved manner so as to isolate with ***explosion-proof bulkheads*** *such areas from the active workings of the mine.*

(3) In case of mines opened on or after the operative date of this title, or in case of working sections opened on or after such date in mines opened prior to such date, the mining system shall be designed in accordance with a plan and revisions thereof approved by the Secretary and adopted by such operator so that, as each working section of the mine is abandoned, it can be isolated from the active workings of the mine with ***explosion-proof seals*** *or* ***bulkheads.***

30 USC §877(k) requires that any inactive areas of the mine "shall be sealed by the operator in a manner prescribed by the Secretary..."

However, by subsequent regulation, 30 CFR §75.335, the Secretary has allowed mine operators to submit ventilation plans which included alternate methods or materials for sealing worked-out or abandoned areas of the mine. This regulation affected all seals installed after November 15, 1992, and allowed the use of other materials, including timber and Omega Blocks, for seals provided they met a 20 psi static pressure test. (The testing of this material by the Mine Safety and Health Administration was completed in 1990, so approval for in-mine use was permitted.)

The initial underpinnings for the regulation rely on a 1971 study by Donald Mitchell, U.S. Department of the Interior, Bureau of Mines at the Lake Lynn Experimental Mine in Pennsylvania. The study, Report of Investigation 7581 (RI 7581) determined that seals placed in mines to isolate worked-out or abandoned areas from working sections need only pass a static pressure test of 20 psi. Previously, the Department of Interior had established a 50 psi static pressure requirement for seals. The lower standard was, however, contingent upon other factors being accounted for and monitored.

There is a marked difference between static pressure cited here as the pounds-per-square-inch a seal must withstand and the forces of an explosion. Static pressure refers to the pressure waves that strike the seal from an explosion as they pass by it or parallel to the seal as it travels down the entry adjacent to the crosscut. This type of testing does not subject the seal to the direct forces of an explosion, or the dynamic pressure. It is not clear why the tests were performed in this manner, given that the forces from an explosion within a sealed area will push outward in all directions, including directly toward the seals.

Mitchell stated in his opening that, "The Federal Coal Mine Health and Safety Act of 1969 requires that such areas [worked-out or abandoned] be ventilated or sealed with explosion-proof bulkheads, but the present study indicates that bulkheads alone cannot isolate areas in the coal mine in which methane or other dangerous gases have accumulated. Gas-air exchanges between sealed and open areas must be controlled." *(Mitchell RI 7581, page 1)*

The determination that a seal must only withstand a static pressure of 20 psi to be approved by MSHA for use in a coal mine relied on several other factors being controlled by the mine operator. Mitchell concluded that an explosion occurring within a sealed area will never exert more than 20 psi static pressure for a distance greater than 200 feet from where it originates, provided coal dust is not involved. Fur-

ther, seal leakage must be controlled to ensure the area does not flow in and out of the explosive range of methane. These factors are crucial in determining the effectiveness of the seals.

Mitchell noted that, "A leakage rate as small as 100 cubic feet per minute (CFM) will cause an exchange as great as 1 million cubic feet of atmosphere between open and sealed areas within a week." *(Mitchell RI 7581 at page 3)* In real terms, a sealed area containing 4 million cubic feet of atmosphere, with an inert methane mixture at 20 percent of the total volume, could present a real hazard should it leak into the active area of the mine at a rate of 100 CFM.

In the course of a week, the atmospheric change could reduce the methane accumulation to 15 percent, creating a potentially explosive methane-air mixture. This leakage is affected by several factors, including increase or decrease in fan and barometric pressure. Decreases in the pressure against the seals will allow the seals to out gas into the active mine, changing the methane-air mixture of the sealed area.

Mitchell concluded, "To isolate sealed areas from active workings, pressure within the sealed area must be relieved; gas-air exchanges between sealed and open portions of the mine must be controlled; and gas leakage from sealed areas must be directed into return air courses, preferably through the bleeder entry. **Further, sealed areas should not adjoin intake air courses.** If they must, then atmosphere in the intake air should be continuously monitored by a system that gives warning should harmful gases be detected, or other suitable means that protect the health and safety of the men in the mine." *(Mitchell RI 7581, page 8)*

The Union disagrees with Mitchell's determination that a seal need only withstand 20 psi static pressure in order to be sufficiently protective of miners. Even in isolation, this minimal requirement does not take into account the ever-changing and dynamic atmosphere that exists in the sealed area. The mixtures of gases within the sealed area are, by nature, subject to erratic changes and are free-moving bodies of various gases. It is impossible to determine how close in proximity an explosive mixture is to the seals. Therefore, it is not practical to use the 20 psi at a distance of 200 feet calculation in determining the pressures that may be applied to the seals.

The UMWA also contends that simply looking at static pressure is improper and incomplete. The explosive forces created when a methane-air mixture is ignited also generates extreme dynamic forces that travel in all directions from the epicenter of the blast. This dynamic pressure must be considered when determining minimum standards for seals.

The Union does agree with Mitchell that sealed areas of the mine must be continuously monitored to insure a pro-active plan for controlling gob gases remains in place and is followed as necessary.

The final basis for 30 CFR §75.335 and the inclusion of other seal construction materials, including Omega Block, was completed in 1990 by Clete Stephan, MSHA's Principal Mining Engineer of the Bruceton Safety Technology Center.

Stephan agreed with many of the determinations of Mitchell, including the 20 psi standard, leakage flows from sealed to active workings, the effects of changes in fan and barometric pressure and the need to actively control gob gas exchanges into the open area of the mine.

However, unlike Mitchell, he determined that "§75.329-2, which states that seals...may be constructed of...incombustible material" *(Stephan, Omega 384 Block as a seal construction material at page 4)* is a very stringent test for seal construction material. He defines the incombustible aspect of a seal as, "one that is intended to keep the material used to build a seal from creating a fire hazard or contributing fuel to a fire or explosion." He therefore suggested that, "A less restrictive term... noncombustible," *(Stephan, Omega 384 Block as a seal construction material at page 4)* should be applied to seal testing. In his final determination on the subject he stated that, "Another way to define incombustible for seals is that the total structure is capable of providing a certain fire resistance. The fire resistance rating is essentially the time the wall can be expected to resist the passage of heat, flame or hot gases, any of which could ignite combustible material on the opposite side of the wall when the wall is subjected to heat from a carefully controlled source, such as a furnace." *(Stephan,*

Omega 384 Block as a seal construction material at page 4) Stephan determined that, "A one hour fire resistance as per ASTM E-119(4) (American Society for Testing and Materials) or equivalent, would be reasonable." *(Stephan, Omega 384 Block as a seal construction material at page 5)*

Based on his decision that incombustible is a fire-resistance definition, Stephan then determined that, "...There are combustible materials, such as wood, which are capable of providing one-hour fire resistance according to ASTM E-119(4). Basically it requires that such a seal be thick enough to prevent passage of flame or hot gases for one hour." *(Stephan, Omega 384 Block as a seal construction material at page 6)*

He then determined that Omega Blocks meet this incombustible requirement and proceeded with explosion-testing of the material, despite the intent of Congress and specific Mine Act language.

The seal testing performed on October 10, 1990, included four Omega Block seals constructed in various configurations. It is important to note that all were hitched six inches into the bottom and ribs. Two were constructed with two pilasters and two were built with a single pilaster. The seals were subjected to a single explosive force of 20 psi static pressure.

The seal descriptions and test results are as follows:

Seal # 2 Crosscut	**Description**	
	Seal Thickness	32 inches
	Number of Pilasters	2
	Pilaster Thickness	48 inches
	Pilaster Width	48 inches
	Keying	Floor (6 inches) and Ribs (6 inches)
	Joints	Staggered
	Bonding Agent	All joints, inby face and outby face with Burrell Bond
	Bond Thickness	1/4 inch minimum
	Wedging	Approximately 6 inches to 1 foot on top
Test Result	Survived Blast	
	Passed Air Leakage	
	APPROVED	

Seal # 3 Crosscut	**Description**	
	Seal Thickness	24 inches
	Number of Pilasters	2
	Pilaster Thickness	48 inches
	Pilaster Width	48 inches
	Keying	Floor (6 inches) and Ribs (6 inches)
	Joints	Staggered
	Bonding Agent	All joints, inby face and outby face with Burrell Bond
	Bond Thickness	1/4 inch minimum
	Wedging	Approximately 6 inches to 1 foot on top
Test Result	Survived Blast	
	Failed Air Leakage	
	NOT APPROVED	

Seal # 4 Crosscut	Description	
	Seal Thickness	24 inches
	Number of Pilasters	1
	Pilaster Thickness	56 inches
	Pilaster Width	42 inches
	Keying	Floor (6 inches) and Ribs (6 inches)
	Joints	Staggered
	Bonding Agent	All joints, inby face and outby face with Burrell Bond
	Bond Thickness	1/4 inch minimum
	Wedging	Approximately 6 inches to 1 foot on top
Test Result	Survived Blast	
	Passed Air Leakage	
	APPROVED	

Seal # 5 Crosscut	Description	
	Seal Thickness	24 inches
	Number of Pilasters	1
	Pilaster Thickness	48 inches
	Pilaster Width	48 inches
	Keying	Floor (6 inches) and Ribs (6 inches)
	Joints	Staggered
	Bonding Agent	All joints, inby face and outby face with Burrell Bond
	Bond Thickness	1/4 inch minimum
	Wedging	Approximately 6 inches to 1 foot on top
Test Result	Survived Blast	
	Passed Air Leakage	
	APPROVED	

The Union has never agreed with several of the determinations by Stephan. We believe that his redefinition of "noncombustible" coupled with the 20 psi standard put forth by Mitchell is a significant reduction in miners' health and safety. Considering the potential forces from a gob gas explosion, permitting the use of lighter and therefore less substantial materials for seal construction reduces their effectiveness. The Union contends that the forces needed to cause the catastrophic failure of an Omega Block is substantially less than previously approved seal material, and that it cannot be classified as a reliable sealing material.

Likewise, Stephan's determination that the mandate of Congress when it required "noncombustible" was not what it intended, but was something less, is not appropriate. This redefinition flies in the face of the "no less protection" standard MSHA is required to meet when promulgating regulations.

Finally, it is important to note that the requirements for seal construction today are significantly reduced beyond even what was outlined by Mitchell and Stephan. In practice, Omega Block seals are not required to be built with any pilasters unless they reach a height of over 8 feet. Neither does the agency require hitching of the seals into

the bottom or ribs. There can be no doubt that these types of applications will not even provide the minimal protection to miners outlined in the 1990 tests cited above.

With regard to implementing the minimal monitoring of seals, both inby and outby, as advocated by both Mitchell and Stephan, the Agency has failed the nation's miners. The approval process has become a rubber stamp for the 20 psi requirement and no other protections. More often than not, MSHA and mine operators treat the areas beyond the seals as if they are not a part of the mine. Because mine operators are not even required to do routing leakage tests to determine the effectiveness of the seals, there is no process by which they can determine the relative safety of the sealed area.

Since the disaster, MSHA initially placed a moratorium on the use of Omega Blocks for seal construction. The Agency has reassessed its position and determined that seals must withstand at least 50 psi of static pressure. The Agency did not limit any type of material currently used in the industry, including Omega Blocks. MSHA has made this determination despite ongoing testing to determine the potential pressure seals must withstand in the event of an explosion.

This practice does not enhance miners' health and safety, and MSHA should revert back to the Congressional mandate outlined in the 1969 Coal Act and reiterated in the 1977 Mine Act by requiring the use of explosion-proof seals or bulkheads in areas of the mine that are permanently abandoned and/or worked out.

The seals must be examined each shift to ensure their integrity. Further, mine operators must be required to continuously monitor the atmosphere inby the seals from locations on the surface.

The Union believes the current protocol used for testing and approving seals is flawed. The National Institute of Occupational Safety and Health (NIOSH) recently issued a draft report entitled "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines." The report addresses two critical issues:

a. What explosion pressures can develop during an explosion within a sealed area, and;

b. What are the appropriate design criteria for seals that will withstand these pressures?

The UMWA recommends that MSHA promulgate a regulation that would require the construction of seals that meet the mandates of Congress outlined in the 1977 Mine Act and the recent recommendations of NIOSH's draft report on mine seals.

Mine Seals (2nd Left Mains)

As noted previously in this report, based on conditions encountered in the 2nd Left Mains Section of the mine, a decision was made to abandon and seal the area from the active workings of the mine. According to Jeff Toler, Superintendent, mining ceased, "...around the 1st of October..." *(Toler page 145 line 17).*

Shortly after mining ceased in 2nd Left Mains, a decision was made to submit a plan to utilize Omega Blocks to seal the area. In response to questions by MSHA regarding the decision to request plan approval for Omega Blocks rather than using packsetter seals (as had been previously done), Toler stated, "I have some history. I've built a few seals in my career, and if I'm building the seal, I would prefer an Omega seal." *(Toler page 122 at line 10)*

The request for approval for Omega Block seals in excess of eight feet was reportedly done for seals to be built in 1st Left Section, at a later date. These seals required additional support in the form of pilasters—a single pilaster for seals over eight feet, but less than ten feet and two pilasters for seals over ten feet but less than 12 feet. The #1 seal located in #1 entry of the 2nd Left Mains Section exceeded eight feet in height for a distance of seven feet on the left side looking inby, but was not constructed with a pilaster as required.

Jeffrey Snyder, Outby Foreman, was assigned the task of building the seals by Jeff Toler, Superintendent. Snyder stated that Toler indicated on the mine map where the seals were to be placed, and then they reviewed the seal plan. Though the effectiveness of training miners on new tasks is extremely important, there is some question as to the training received in this instance based on the testimony of Snyder. He states, "It (the training) was kind of a before the shift started kind of thing, where the office is kind of chaotic and you're trying to get ready for the day." *(Snyder page 29 at line 22)* Snyder was then given a copy of the seal plan.

Construction of the 2nd Left Mains seals began on October 24, 2005, the same day the approval was received from MSHA. Snyder was assigned to supervise the construction with a crew that generally consisted of three miners, including Jeremy Toler, Casey Short and George Brooks. Prior to constructing the seals, the crew removed the roof mesh as required. During construction, four other miners, Marty Conrad, Mike Trippett, John Jackson and Harmon Jordan, would occasionally help. None of the crew, including Snyder, had ever installed Omega Block seals previously. Snyder stated in his testimony that he reviewed the sealing plan with the members of his crew. He does not remember if he instructed the other miners who helped. In his testimony he noted, "I went over it with everybody that was helping me in charge. I don't think I covered it with every individual, the seal plan. I tried to, but I may have missed one or two, maybe three, I don't know." *(Snyder page 77 at line 7)*

The first seal to be built was located in the #8 entry. The crew completed it to a height of about four or five feet when Toler discovered it did not meet the requirements of the plan and had to be moved. Snyder stated, "...I didn't have it in the right spot and the superintendent came up and we had it over halfway built and he made us tear it down and put it in the right spot." *(Snyder page 46 at line 4)* The seal was moved approximately four feet further inby the edge of the rib and the crew started rebuilding the seal to a distance ten feet inby the rib as required by the approved plan. This seal was constructed using at least some of the Omega Blocks that had been used previously, according to Snyder. He also testified that during construction, the crew was not always able to seal all the joints with b-bond or place the required number of wedges on the middle board on the top of the wall.

SUBMISSION AND APPROVAL OF OMEGA BLOCK SEALS

1. October 12, 2005
   Anker West Virginia Mining Company
   Sago Mine Ventilation Plan Changes

   To: Mr. Kevin Stricklin, District Manager, MSHA District 3
   Request to add Omega Concrete Block Seal Method, non-hitched style to the Ventilation Plan.
   Joe Myers for Al Schoonover, Safety Director

2) October 19, 2005
   Guidelines for installation of Omega Block Concrete Seals
   Stamp of receipt from MSHA District 3
   (noted as revision in approval letter)
   Unsigned

3) October 24, 2005
   U.S Department of Labor
   Mine Safety and Health Administration, District 3

   To: Jeffrey Toler, Superintendent, Anker West Virginia Mining Company
   Requests of October 12, 2005, and revision of October 19, 2005, to add alternative method of seal construction is approved.
   Kevin Striklin, District Manager, MSHA District 3 (stamped)

4) October 28, 2005
   Anker West Virginia Mining Company
   Sago Mine's Seal Proposed Plan Amendment

   To: Mr. Kevin Stricklin, District Manager, MSHA District 3
   Request to amend the proposed mine seal plan submitted September 29, 2005, to permit the use of Omega Block mine seals, with pilasters, in areas that exceed 8 feet in height. (*The UMWA is not in receipt of this document*)
   John Stemple, Assistant Director of Safety and Employee Development

5) October 31, 2005
   U.S Department of Labor
   Mine Safety and Health Administration, District 3

   To: Jeffrey Toler, Superintendent, Anker West Virginia Mining Company
   Requests of October 31, 2005, to add alternative method of seal construction is approved.
   Kevin Striklin, District Manager, MSHA District 3 (stamped)

All correspondence relating to the above matters are included at the end of this report as Appendices 9-12.

With the exception of the day Toler made them move the initial seal, Snyder does not remember any specific time he or the Mine Foreman, Crumrine, were in the area. He notes they occasionally came to the area, but did not offer any specific comments or instructions.

Snyder ceased working on the seals on November 9, 2005, when he was reassigned to another job in the mine. He was replaced by James Scott, a certified foreman working at the Sago mine as a contract miner with Garrett Mining Service (GMS). He had been at the operation in that capacity for about two years at the time of the explosion.

There are discrepancies between the testimony of Scott and Snyder, and while that is not uncommon, it is also important to highlight the more notable ones. Snyder stated of the ten seals constructed, he helped build the first seven before Scott took over. However, Scott states, "The last five (seals) I built." *(Scott page 25 at line 2)* There were ten seals in all. Scott also stated that both he and Snyder received the seal plan training from Toler at the same time. As noted previously, Snyder said he received the training from Toler at the start of the shift, and when asked if anyone else was present, stated, "I don't recollect anyone else standing in." *(Snyder page 29 at line 21)*

Scott supervised the construction of the final seals, including the #1 seal that contained the water trap and #10 where the sampling tube was located. George Brooks and Casey Short, who were assigned to Scott, were new contract miners from GMS; their first day underground was October 31, 2005. Like the previous crew assigned to build the seals, none had any experience with Omega Blocks.

Scott's crew constructed the seals in generally the same manner as the previous ones. They testified that they were not able to get b-bond into all the joints, and that it was often too difficult to place all the required wedges on the middle board at the top of the seal. In fact, when asked if all the seals were built with three boards on top as required, Casey stated, "No. Like I was telling you earlier, the best you could do, they said, you know, you need to use three if you can." *(Short page 106 at line 9)* They also reported that they used wedges between the Omega Blocks and the ribs to keep the wall tight from side to side, and that pieces of wood and paper were used to fill gaps between the rib and blocks.

The seals were completed, according to Scott, on December 12, 2005. He then finished making the required air changes. The 2nd North Mains sealed area was left to self-inert.

The questionable construction of the seals seems obvious when looked at in their entirety. Missing fly boards, the inability to wedge the center of the structures, unapproved material being used to secure the seals rib-to-rib and serious questions about the application of the bonding material all raise concerns about their integrity and effectiveness in separating the active area of the mine from the sealed area. However, even if the seals had been constructed according to the approval, they would have failed catastrophically against the explosive forces on January 2, 2006.

Nevertheless, there are questions with regard to these particular seals that must be viewed as systemic problems at the mine, including lack of experience, poor training and inadequate oversight. The failure to correct these was inexcusable.

The discrepancy between Scott's and Snyder's testimony is problematic, but not the real issue. The real problem is not whether their training session occurred together or separately, but the implications are extremely important because it indicates that training for new tasks was not given a high priority. The real concern must be the extent of the training, especially given the fact that no one working this assignment had any experience with these types of seals. In fact some of the laborers had very limited mining experience at all.

Where experience is lacking, as was the case here, training and supervision of the task must be done in such a way as to ensure miners thoroughly understand the construction process and the importance of their work in the overall operation of the mine's ventilation system. Scott's recollection that training on the seals occurred with Snyder present and Snyder's statements that the training happened between shifts when it was chaotic indicate the information was not passed on in a methodical or instructive manner. Further, the foremen assigned to

the task cannot say with any certainty that everyone who assisted them in the seal construction was ever trained in the job task. In fact, one foreman noted during questioning that, "They're seals. If you can build one, you can build them all." *(Conrad page 35 at line 4)* The training that was given to some of the crew was done underground immediately before they began work on the seals.

This type of casual instruction is unacceptable. In many instances, miners' lives depend on training. This is not limited only to evacuation and SCSRs, but includes equipment operation and systems' construction. The operator failed to properly execute training in this case.

By all accounts, oversight of the seal construction process was almost non-existent. From the testimony, there does not appear to have been anyone from middle or upper management or the regulatory agencies who spent any substantial time in the area during the construction of the seals. This should never be the practice during a project that plays such a key role in the mine's ventilation system. However, considering that the location of these seals was immediately outby the mouth of an active working section in a blowing ventilation system, it was even more crucial to have proper oversight of the construction.

Based on these findings, the Union does not believe that adequate steps were taken to ensure proper construction. Therefore, setting aside the fact that Omega Blocks seals should not have been approved, what went wrong during seal construction was the result of inadequate training and insufficient oversight.

It must also be pointed out that the approval of this seal design is not realistic from a construction standpoint. Miner after miner noted that because of the thickness of the Omega Block wall and the limited distance between the seal top and the roof, placing wedges on the middle "fly board" was almost impossible. The Union submits that construction requirements of the approved plan for these types of seals were practically impossible to adhere to, and should not have been approved.

The facts noted above are important to evaluate the overall effectiveness of training and oversight at the mine, however, they do not address the real problems with these seals. Omega Blocks are not designed to withstand the forces that can be generated in the underground areas of a coal mine. This is obvious by the pulverization of nine of the ten seals at the Sago mine. Unfortunately, it is not the only time they have proven to be inadequate for use in the mining industry. Recent events at Drummond Coal's Shoal Creek mine in Alabama and Kentucky Darby's Darby Mine No.1 are other examples of the Omega Block failures.

The UMWA urges MSHA to return to the mandates set out in the 1969 Coal Act and the 1977 Mine Act and require the use of explosion-proof seals or bulkheads and implement the recent recommendations of NIOSH's draft report on mine seals to separate mined-out or abandoned areas from the active workings of the mine.

Roof Control

Coal mine operators are required to submit a roof control plan that outlines the minimal requirements for supporting the mine roof to the federal and state regulatory agencies for approval prior to initiating any mining activity. The agencies are responsible for reviewing these plans at least every six months thereafter. Roof control plans usually remain unchanged unless mining conditions warrant modifications. These modifications can be requested by the operator or required by the agencies depending on the circumstances. The modifications are submitted to agencies and generally amend certain specific sections of the approved plan. Submission of a new plan can be initiated by either the mine operator or requested by either agency and usually occurs when modifications are so numerous that the plan becomes confusing.

The last complete copy of the Roof and Ground Control Plan for the Sago Mine was submitted on September 16, 2004, by Al Schoonover from the Safety Department of Anker West Virginia Mining Company, Inc.

The plan indicates that the immediate roof in the mine consists of 20 feet of gray shale, and above that, the main mine roof is sandstone. Entry and crosscut widths are not to exceed 20 feet, and crosscuts may be turned off the entry between 48 and 110 foot centers. The distance between crosscuts is generally dictated by the roof conditions encountered in a particular area of the mine.

The roof was to be primarily supported by the use of either 5-foot fully grouted (glued) tension bolts or by a combination of 4- and 6-foot fully grouted bolts installed in a staggered pattern. This would be considered the normal bolting pattern for the mine. The use of 10-foot non-tensioned cable bolts were to be installed as supplemental and only as needed. The specific installation requirements were contained in the plan. There were also additional requirements for when unexpected adverse mining conditions would be encountered.

In addition to the general information, the plan requires that supplemental roof support be used for the development of mains and sub-mains at the Sago mine. This required that screen wire, with openings no greater than 4 inches by 4 inches, be bolted to the roof in the track and belt entries. The primary escapeway and one return aircourse were required to have one of the following supplemental support systems installed: roof sealant, roof bolt plate at least 17 inches square, wire screen with openings no greater than 4 inches square or two rows of posts no greater than six feet apart. The plan was approved by MSHA District 3 on October 4, 2004.

The 2nd Left Mains Section was one of the areas of the mine that required supplemental roof support to be installed. The use of these supplemental materials demonstrates the Section was encountering adverse roof conditions. The application of the minimum supplemental support indicates that the operator expected to encounter difficulty supporting the immediate roof.

The mine encountered several roof control problems over the next ten months that required modifications be made to the roof control plan, including the use of truss bolts and tunnel arches. The use of these supports indicates that problems were being encountered beyond the anchorage point of the bolts. This would affect the main mine roof, generally causing roof falls above the anchor points of the bolting pattern.

The first modification of the roof control plan specifically identifying the 2nd Left Mains Section was submitted by the operator on or around August 16, 2005. The new plan required screen wire, with openings no greater than 4 inches by 4 inches, to be installed in the primary escapeway in addition to the track and

belt entries. This type of requirement indicated that the local roof conditions were bad enough to require a specific type of supplemental support at all times.

The roof conditions continued to deteriorate, and the operator made a second request to modify the roof control plan sometime between August 22–26, 2005. Based on the conflicting dates on the documents, it appears information was being passed between the operator and MSHA to address the situation (this is a standard and accepted practice in the industry). The first modification submitted by the operator *(Roof Control Plan Amendment: page 2a)* for controlling the roof required the operator to install screen wire on the immediate mine roof so as to "reduce exposure of falling material to personnel" (indicating all headings were to be screened), reduce the width of the entries from 20 to 18 feet, and increase the size of the roof bolt bearing plates. There is no MSHA approval attached to this modification.

The operator then submitted a second request to the August 22–26, 2005, modification *(Roof Control Plan Amendment: page 2a1)* that included minimum requirements beyond those originally submitted. In addition to those cited above, the modification required: the installation of 8-10 foot cable bolts in four-way intersections, 6-10 foot cable bolts in all three-way intersections, and two 10-foot cable bolts on 8-foot centers as mining advanced. Further, the plan modification noted, "The above stated stipulation will be in effect while the current roof conditions exist." MSHA approved the plan modifications on August 29, 2005.

The UMWA is convinced that these modifications and the dialogue between the two parties show a sense of concern on both their parts about the roof conditions. The changes to the plan approved on August 29, 2005, cannot be understated; they represent an understanding by the parties that the roof conditions were progressively getting worse, and that the conditions could not be corrected without extensively enhancing the roof control requirements.

On September 19, 2005, the operator submitted a modification to MSHA requesting that second mining be permitted in limited "test" areas of two sections of the mine including areas in the 2nd Left Mains Section. This amendment would permit the mining of the lower bench of the Kittanning seam of coal, which is located immediately beneath the originally mined seam at a depth of between 1-1/2 and 10 feet. Mining this coal seam would eliminate any further advancement of the 2nd Left Mains Section and require the eventual abandonment of the area. MSHA approved the plan on September 21, 2005.

On September 21, 2005 an MSHA official stated in a letter to Sago mine Superintendent, Jeffery Toler, "As you are aware, increasing the opening height of entries and crosscuts to the extent in your request decreases the stability of the coal and rock ribs and increases the hazards related to falls in areas where persons are required to work and/or travel."

The dangers associated with second mining have been discussed previously in this report. However, it is important to note that MSHA was well aware of the dangers that this practice would create at the Sago mine.

The operator requested modifications to permit second mining of additional areas of 2nd Left Mains Section be approved between October 3-7, 2005. MSHA approved the request on October 7, 2005. After completion of second mining, the area inby 62 block of the 2nd North Mains was abandoned, and the plans were approved by MSHA to seal the area.

A month after MSHA's approval of the second mining, on November 7, 2005, miner Charles Donegia was struck by rock and coal in an area that had been second mined. Donegia suffered permanently disabling injuries including two broken vertebrate, broken ribs, a collapsed lung and a ruptured spleen.

An investigation into the accident found that the operator exceeded the parameters of the mine's roof control plan, and that additional roof support that was required was not installed. Despite these findings the company did not correct the conditions when MSHA returned to the mine. The Agency also cited the company for not recording the conditions in the pre-shift report as required.

The modifications to the Roof Control Plan reveal ever-deteriorating roof conditions in the 2nd Left Mains Section. Management assessed the situation and determined that it was no longer feasible to continue mining in the area.

It is clear that by constantly modifying the roof control plan, conditions were changing in the affected area and that the operator and the regulatory agencies were aware of the deterioration. Still, the modifications required at the Sago mine do not give the complete story of the severity of the situation. During the investigation into the explosion, many of the miners testified about the adverse conditions in 2nd Left Mains Section. Their testimony is very important to understanding the magnitude of the problem.

Lonnie Short, Weekend Shift Foreman

When asked about abnormal conditions in 2nd Left Mains Section, he stated, "We just had a lot of bad top." *(Short page 30 at line 13)*

When asked what the roof conditions were in the area he stated, "I mean we had a lot of bad top up there. We set brow bolts—I mean, brow extenders, or whatever they call them." *(Short page 33 at line 10)*

Further, he noted, "Cable bolt intersections and at last, I think we screened every entry, but I'm not sure." *(Short page 33 at line 15)*

When asked why they pulled out of the area, he said, "It's all water and bad top. We was cable bolting every intersection, 12 and 14s, 10s. Tens, 12s, 14s cable bolts." *(Short page 33 at line 20)*

Jeff Snyder, Outby Foreman

When asked if he knew why mining was stopped in 2nd Left Mains Section, he said. "Yes sir, I do, it was adverse conditions. The mining process became intolerable." *(Snyder page 89 at line 25)*

When asked what those adverse conditions were, he stated, "We was running into bad roof and excess water." *(Snyder page 90 at line 5)*

Seth Osborne, Laborer

When asked what work he did in the 2nd Left Mains Section, he said, "...We screened (the roof) all the way up, pretty much all the way in there." *(Osborne page 49 at line 16)*

He further stated, "It was always pretty—you always had to keep your eyes on top, which you always do, but it was—it was more flaky in spots." *(Osborne page 49 at line 24)*

Darrel Lucas, Roof Bolter

In his description of 2nd Left Mains Section, he said, "Most of it was pretty bad top." *(Lucas page 23 at line 7)*

When asked to describe what he meant, he stated, "It was falling in everywhere. We set up rail plates, screen, we cable-bolted the section in a lot of places, because the 6-foot bolts didn't anchor in for the sand rock, we just did cable bolts." *(Lucas page 23 at line 17)*

When asked what the immediate roof strata was and what fell in, he said, "I guess sometimes it was sand rock. But most of it was slate." He further stated, "But some of it, I seen sand rock fall in, too." *(Lucas page 24 at line 5)*

Jeff Toler, Superintendent

"Well, we were advance mining, and toward the end of the panel, we were having some roof conditions." *(Toler page 145, line 21)*

When asked about roof falls in 2nd Left Mains Section, he stated, "Two falls, one in #1 entry, it was pretty good—it was a pretty long fall. I'm thinking it went a crosscut, maybe two crosscuts right down the entry, which would put it in excess of 100-foot long, probably six feet high, at least. And we had another one—we had one in the track entry that was about a crosscut long. It fell pretty high. ...eight, ten-foot, maybe higher." *(Toler page 149 at line 3)*

Al Schoonover, Safety Director

When asked if he was familiar with the 2nd Left Mains Section, he stated, "I would—yeah I would investigate roof falls up there." *(Schoonover page 81 at line 16)*

John Boni, Pumper

When asked if he knew why mining was stopped in 2nd Left Mains Section, he stated, "Adverse conditions." *(Boni page 131 at line 5)*

He further stated, "They were getting a lot of water. Some of the top wasn't real good..." *(Boni page 131 at line 8)*

John Collins, Inspector, West Virginia Office of Miners' Health, Safety and Training

> When asked if he ever noticed anything unusual in 2nd Left Mains Section, he stated, "Number two—old two Left had real adverse roof conditions. We had a permanent disabling injury up there with a piece of roof. That's why they were required to go full screen in the brow tenders." *(Collins page 47 at line 18)*

As noted previously, mine operators or the regulatory agencies can request modifications to the roof control plan. These changes are a common occurrence in the industry and do not necessarily represent anything out of the ordinary. A modification will, however, give clear indications of the conditions that are being encountered in specific areas of the mine. The series of requests, with increasingly stringent measures at the Sago mine, demonstrated that conditions were continuing to deteriorate and additional measures were necessary in an attempt to address the problems.

This is clearly the case in the 2nd Left Mains Section of the Sago mine preceding management's decision to abandon the area. The fact that the final decision was made to stop advance mining and seal the area shows that even the supplemental roof controls were not sufficient. There is every indication that the mine roof was too unstable to permit mining.

It is likely that the conditions in 2nd Left Mains Section continued to worsen during the retreat mining and while the seals were being constructed. This became obvious during the accident investigation when mapping of the area revealed adverse roof conditions and roof falls that were not present before the area was abandoned.

These roof conditions would have continued to present an even greater hazard once the area was sealed. Shifting of the roof strata and roof falls often create friction and sparking as the materials rub together or become dislodged and strike other materials as they fall. Roof falls create cavities where methane can accumulate. Previous reports have shown that frictional arcing can cause methane ignitions in sealed areas.

This problem is further compounded by the metal roof bolts, plates, straps and other materials—including oil and hydraulic cans, cables, equipment and other supplies left behind. Pressure exerted on point anchor and combination roof bolts can cause them to fail and become dislodged from the roof strata. This is also true for cable bolts: the weight of the rock compromises their ability to support the roof, and they are sheared off. This "popping" of the bolts releases energy and will in many instances cause arcing at the point of separation. The danger is compounded when the metal bolts strike other materials, including additional roof supports or rock in the area. These situations can create sparking which can ignite methane if an area has not been inerted.

Finally, the testimony of miners at Sago and the statement by mine inspector Collins indicated that, as mining progressed in 2nd Left Mains Section, wire screen was required in every entry. While the installation of wire screen to support the local roof was necessary to protect miners working in the Section, it proved to be a potential ignition source within what became the sealed area.

As the roof deteriorates and settles, it can exert pressure on the wire. Sudden shifting of the rock or wire can cause arcing. In addition, the pressure from the roof can cause sections of wire to shift and rub against one another. The action of metal rubbing against metal can create additional ignition sources.

Based on the underground investigation of the Sago mine and the information obtained during the interview process, the Union is convinced that the roof in the 2nd Left Mains Section continued to deteriorate after mining in the area ceased. These conditions, together with the additional roof support required, created an undeterminable number of possible ignition sources.

Based on the facts of the investigation, the United Mine Workers of America finds that the most likely cause of the explosion was frictional activity from the roof, roof support or support material igniting the methane-air mixture.

The suggested ignition source offered by ICG and WVOMHST represents a self-serving and predetermined theory that the ignition source was beyond their control. The facts of the investigation, as well as the long history of coal mining, indicate that frictional activity from the roof, roof support or supporting material was a more likely source of the ignition.

Ventilation

Based on the information received from the federal and state regulatory agencies and observations made during the underground investigation, the Union has made the following assessment of the ventilation system at the Sago mine.

The mine was ventilated by a Joy 400 horsepower fan installed in a blowing type system. The fan produced approximately 125,000 cubic feet of air per minute (CFM) and was located at the mine mouth in the #5 entry.

Prior to the completion of the 2nd Left Mains seals and the installation of other ventilation controls, the #9 entry from the 2nd Right Section inby was used as a return. In this ventilation scheme, intake (fresh) air was coursed up #7 and #8 entries, inby the 2nd Right Section. It then crossed over the other entries from right to left through a series of overcasts and regulators to ventilate the 1st Left and 2nd Left Parallel Sections and the abandoned 2nd Left Mains Section.

The active working sections (1st Left and 2nd Left Parallel) were both ventilated in the same manner. Intake air would enter the section in #7 and #8 entries, sweep across the faces, and return in #1 and #2 entries to the mouth of the sections. The 1st Left Section ventilated the "butt" sections off of #1 entry as they advanced.

The abandoned area of 2nd Left Mains Section was ventilated by the same split of intake air used to ventilate 2nd Left Parallel Section. The ventilation entered the area in the #1 entry of 2nd Left Mains Section, swept the faces and returned in the #9 entry of 2 North Mains, inby the 2nd Right Section. The return air crossed over entries 5, 6, 7 and 8 and dumped into the main return at 2nd Right Section. Immediately after the completion of the seals, the mine ventilation remained the same. This meant the ventilation swept the inby side of the seals from left to right (from #1 entry to #9 entry). This ventilation scheme pushed the return air from the seals outby and away from the active 2nd Left Parallel Section.

According to testimony, on December 12, 2005, mine management completed a major ventilation change that affected the airflow from 2nd Right Section inby. From that point, the #9 entry was changed from a return to an intake entry. Intake ventilation was coursed into the working sections in #7, #8 and #9 entries by means of overcasts and other ventilation controls much as it was prior to the air change. However, a portion of the intake was split and pushed up the #9 entry to ventilate the seals. The seals were then ventilated from right to left, pushing this air towards the mouth of 2nd Left Parallel Section.

This air split would pass by the seals from entry #9 to entry #1 before being coursed into the #2 return. At this point the return entry was separated by only one brattice wall from the 2nd Left Parallel Section main intake.

This ventilation design was not sufficiently protective of the miners. The fact that a single brattice wall was all that separated the intake of the 2nd Left Parallel Section from air that had ventilated the seals is a cause of concern and should not be permitted. Mitchell even made special note of this in his report when he stated, "Further, sealed areas should not adjoin intake air courses." *(RI 7581 at page 8)*

It is clear that the explosion destroyed the seals and damaged ventilation controls in the 2nd Left Parallel Section and further outby. When this occurred, the single wall separating the return from the intake was also destroyed. Because of the mine's blowing system and ventilation design, the contaminants from the explosion were forced into the 2nd Left Parallel Section's primary and secondary escapeways.

The UMWA contends the ventilation system in place at the mine at the time of the explosion did not adequately protect the miners.

Consideration of Lightning as a Potential Cause

The Union has completed an exhaustive review of data obtained from the Mine Safety and Health Administration, the West Virginia Office of Miners Health, Safety and Training, the United States Bureau of Mines reports and the National Institute for Occupational Safety and Health, in an effort to determine the potential for a lightning strike that occurred over two miles away to cause the explosion at the Sago mine.

The Union received information from MSHA's Warehousing Group in Denver, Colorado, identifying 1,151 incidences of ignitions and 35 reports of underground mine fires since 1995. The vast majority of these reports were of ignitions of methane gas accumulations, generally caused by frictional activity between mining equipment and the coal/rock faces being mined. There were also numerous reports of ignitions occurring when miners were cutting and welding.

The Union has also reviewed the information on coal mine ignitions and explosions compiled in 1998 by MSHA through the National Mine Safety and Health Academy. That historical reference, the *Historical Summary of Mine Disasters in the United States, Volume II - Coal Mines - 1959 - 1998*, documented the information on the following pages.

From January 29, 1959, to January 24, 1994:

- Total ignitions and explosions reported 2,289

CAUSES (RELEVANT TO THIS REPORT)

- Frictional roof fall 14
- Unknown origin 19
- Lightning (**without conduit**) **0**

FRICTIONAL ROOF FALLS:

	Date	Company	Mine	State
1)	12-14-62	Not listed	Lancashire #15	PA
2)	6-23-66	Not listed	Robena	PA
3)	4-3-67	Not listed	Moss #2	VA
4)	8-10-67	Not listed	Moss #2	VA
5)	8-17-67	Not listed	Forge Slope	PA
6)	6-5-71	Not listed	Humphrey #7	WV
7)	12-5-72	Not listed	Virginia Pocahontas #3	VA
8)	12-26-72	Not listed	Moss #3	VA
9)	3-15-75	Not listed	Virginia Pocahontas #3	VA
10)	12-19-75	Not listed	Olga	WV
11)	3-6-76	Not listed	Lancashire #20	PA
12)	10-7-86	Sidney Coal Co.	Roadfork Mine No. 1	KY
13)	7-27-87	Sidney Coal Co.	No. 1 Mine	KY
14)	12-19-92	Consolidation Coal Co.	Amanota No. 31 Mine	WV

UNDETERMINED ORIGIN:

	Date	Company	Mine	State
1)	5-24-62	Not listed	Shannopin	PA
2)	3-3-63	Not listed	Itman No. 3	WV
3)	1-20-68	Not listed	Jamison	WV
4)	1-9-74	Not listed	Maitland	WV
5)	3-9-76	Not listed	Scotia	KY
6)	3-9-76	Not listed	Scotia	KY
7)	4-10-77	Not listed	Vesta #5	PA
8)	12-19-81	Not listed	Mars #2	WV
9)	9-5-86	Jim Walter	Mine #3	AL
10)	12-12-86	Consolidation Coal Co.	Buchanan #1	VA
11)	4-27-87	Golden Oak Mining Co.	Black Oak No. 2	KY
12)	6-23-88	Green River Coal Co.	Green River Coal No. 9	KY
13)	7-19-88	Clinchfield Coal Co.	McClure No. 1 Mine	VA
14)	12-14-88	Pyro Mining Co.	No. 9 Slope William Station	KY
15)	12-18-89	Birchfield Mining Inc.	Mine No. 1	WV
16)	7-10-90	Clinchfield Coal Co.	Splashdam Mine	VA
17)	1-15-91	Island Creek Coal Co.	VA Pocahontas No. 3 Mine	VA
18)	5-4-93	Jim Walter	Mine #3	AL
19)	8-22-93	Drummond Coal Co.	Mary Lee No. 1 Mine	AL

Neither MSHA nor any other regulatory agency has ever specified the cause of the 19 ignitions and explosions listed above. They have been unable to determine the exact cause of the events because of the existence of several potential possibilities that were found at each event or the conditions caused as the result of the event precluded investigators from making any absolute determination. None of these events was ever attributed to a source outside the underground area of the mine.

In July 2006, Davitt McAteer, former Assistant Secretary of Labor for Mine Safety and Health, was appointed by West Virginia Governor Joseph Manchin, to determine the cause of the Sago disaster and offer regulatory measures to ensure such an event did not occur again.

The Sago Mine Disaster, a Preliminary Report to Governor Joseph Manchin III (Report), makes several statements the Union disputes. These statements are not supported by the facts uncovered during the joint investigation.

First, the statement that, "Based on the available evidence thus far, we do not believe that the Sago mine disaster can be attributed to any specific actions on the part of International Coal Group (ICG), the federal Mine Safety and Health Administration (MSHA) or the West Virginia Office of Miners' Health, Safety and Training (WVOMHST), *(Report at page 12)* is not accurate. The Union has determined, based on the available evidence, that some of the plans proposed by Sago mine management and approved by the regulatory agencies created the conditions that lead to the events of January 2, 2006.

The Report also states that, "Lightning probably caused the explosion." *(Report at page 38)* There is no evidence to support such a finding based on the investigation and additional data the Union has analyzed. Circumstantial evidence, such as timing of lightning strikes and the approximate onset of the explosion, offer no conclusive indication, let alone solid evidence, that the two events are related.

Finally, the Report cites eight specific incidences, excluding the Sago mine disaster, where sealed areas of underground mines were involved in explosions. The Report would suggest that these eight events were somehow relevant to the Sago mine disaster. **They are not.**

The examples in *The Sago Mine Disaster, a Preliminary Report to Governor Joseph Manchin III* noted above did not specify the additional information contained in the UMWA's report. The Report did not include the potential paths that would have enabled lightning to travel from the surface to the affected sealed areas of an underground coal mine, despite this information being noted in the investigative reports. Each of these examples contained a conduit path, should lightning have been the source, for energy to be transferred from the surface into these sealed areas. The Union is certain that these eight cases do not reflect the circumstances present at the Sago mine on January 2, 2006. It is disingenuous for the Report to even suggest that the other explosions have significant characteristics in common with the Sago mine disaster. **They do not.**

On December 11, 2006, WVOMHST issued its *Report of Investigation into the Sago Mine Explosion*, under the direction of Ronald Wooten, Agency Director. The report states on its initial page that, "This represents the final report regarding this matter." However, there are few conclusive findings within the report itself. The repeated omissions, general speculation and lack of solid facts contained in the state's report renders it unreliable. In fact, the report raises far more questions than it answers.

The Union believes that the report by WVOMHST was drastically flawed from the beginning, based on the statement made by one of its primary authors before the underground investigation was even initiated.

The Union has reviewed a January 12, 2006, memorandum (attached as Appendix 16) from Monte Heib, Chief Engineer to then Agency Director Doug Conaway. Mr. Heib noted calibrations made to the mine's CO monitoring system clock and the approximate times of lightning strikes within several miles of the Sago mine. He then stated, "Unless evidence is uncovered in the future which casts doubts on the facts as stated above, there is convincing circumstantial evidence that the explosion at the Sago Mine on January 2, 2006, was directly related to one or both of the lightning strikes recorded at 06:26:35 am, both of which occurred at the opposite side of the Buchannon River from the Sago Mine."

The memorandum by Mr. Heib was written over two weeks before the official underground investigation into the cause of the disaster was initiated. Based on these facts, it is extremely difficult to believe, as a lead member of the investigation team, that he could conduct an impartial and thorough investigation into this matter. Further, being a major author of the report, it is apparent its writing parallels his initial thinking despite the lack of conclusive evidence to support the report's limited conclusion.

The Union's investigation does not find any plausible means for lightning to have entered the Sago mine on January 2, 2006. The facts remain that all the conditions necessary to cause the disaster were present within the confines of the mine.

Neither ICG nor the WVOMHST have cited one example where lightning entered a sealed area of the mine without a direct conduit from the surface to the sealed area. In addition, the Union is unaware of any investigative report by MSHA that offers any such evidence.

The Union has reviewed each of the explosions that were initiated in sealed areas along with MSHA's analysis:

1) 8-22-93 Drummond Coal Company Mary Lee Mine Alabama

An explosion occurred in a sealed area of the mine. Investigators determined that an electrical storm passed through the area around the time of the explosion. They also determined that a vent pipe located atop the 70 North Fan Shaft could have been electrified by a lightning strike and was the probable cause. (**Conduit present**)

2) 4-5-94 U.S. Steel Mining Oak Grove Mine Alabama

An explosion occurred in a sealed area of the mine. Investigators determined that an electrical storm passed through the area around the time of the explosion. A cased borehole was located in the immediate area of the lightning strike. The casing would have acted as a conduit from the surface to the sealed area of the mine. (**Conduit present**)

3) 6-9/16-95 U.S. Steel Mining Gary No. 50 Mine West Virginia

An explosion occurred in a sealed area of the mine between June 9 and 16, 1995. Investigators were unable to determine the source of the ignition. However, they have speculated that the source was either a lightning strike or a frictional roof fall.

There are several paths at the location from the surface that would have permitted energy generated by a lightning strike to enter the sealed area of the mine. A frictional roof fall is also a likely ignition source. (**Conduit present**)

4) 1-29-96 U.S. Steel Mining Oak Grove Mine Alabama

An explosion occurred in a sealed area of the mine. Investigators determined that an electrical storm passed through the area around the time of the explosion. There were several cased test wells located in the immediate area of the lightning strikes. The well casings would have acted as a conduit from the surface to the sealed area of the mine. A frictional roof fall is also a likely ignition source. (**Conduit present**)

5 & 6) 5-15 and 6-22-95 Oasis Contracting Mine #1 West Virginia

Two explosions occurred in a sealed area of the mine. Investigators were unable to determine an ignition source for either explosion. However, they have speculated that a lightning strike or frictional roof fall were probable causes. Cased borehole/wells were located in the immediate area of the lightning strikes. The casing would have acted as a conduit from the surface to the sealed area of the mine. A frictional roof fall is also a likely ignition source. (**Conduit present**)

7) 7-9-97 U.S. Steel Mining Oak Grove Mine Alabama

An explosion occurred in a sealed area of the mine. Investigators were unable to determine the origin of the ignition source, however, lighting was reported above the sealed area about the time of the explosion. Lightning had occurred in the same general location twice previously, May 4, 1994, and January 29, 1996 (noted above). The immediate area of the strikes had numerous cased wells. The casings would have acted as a conduit from the surface to the sealed area of the mine. (**Conduit present**)

8) 5-8-01 U.S. Steel Mining Gary No. 50 Mine West Virginia

An explosion occurred in a sealed area of the mine. Investigators have not determined an ignition source. However, they have speculated that the source was a lightning strike. The area is penetrated by several sealed shafts from the surface to the coal seam. There are also numerous cased wells in the area that would act as a conduit from the surface to the sealed area of the mine. (**Conduit present**)

Conclusion

There were numerous factors that came together on the morning of January 2, 2006, causing the violent explosion and the tragic and unnecessary loss of life. Based on the Union's investigation, and contrary to other assertions, it is not factual to say that events beyond the control of the mine operator or the regulatory agencies simply happened. Nor is it accurate to state the explosion was "an act of God," and thus unavoidable.

The UMWA believes that the decisions made months and years prior to the explosion put a series of events in motion that lead to the disaster. The failure to assess the overall impact of these decisions must be called into question.

Submission and approval of inadequate mining and training plans, improper installation of ventilation controls all have consequences after they are put in place. Each aspect of the mine's overall operating system impacts every other; no specific plan or method of operating is isolated from the others. If thoughtful analysis is not done of each plan or method—not only how they meet the immediate needs they are designed to address, but how they will impact other aspects of the mine's overall system—the possibility of bad things happening can dramatically increase.

The choices the International Coal Group (ICG) made, as approved by the agencies, to address the overall conditions at the mine and how each plan affects the other is even more tragic when we realize the initial explosion may have taken but one life. The fact that 11 other miners died because they were unable to escape compounds the consequences. These consequences could have and should have been prevented if reasonable care had been taken to assess the conditions being created.

The actions by mine management, approved by the regulatory agencies, created the greater potential for an accident than would normally be found in a single area of a coal mine. However, to permit these conditions to be created in an area of the mine so susceptible to frictional activities that can cause arcing, the most probable ignition source for the explosion, was inexcusable.

It becomes apparent based on our findings that there is no conclusive evidence the lightning caused the explosion, as has been suggested in other reports or in others' comments. Based on the facts of the investigation, the United Mine Workers of America finds that the most likely cause of the explosion was frictional activity from the roof, roof support or support material igniting the methane-air mixture.

The events at the Sago mine on January 2, 2006, could and should have been prevented.

Wire screen, such as that in the picture to the left, was common in many areas of the Sago Mine. The West Virginia Office of Miners Health, Safety and Training required mine management to screen almost the entire roof area in the 2nd North Mains Section just prior to abandoning the Section.

In areas that did not require wire mesh, management was required to install large roof bolt plates (pie pans) to support the local roof. Supplemental supports, such as cable bolts, were also required in many areas of the mine to address adverse conditions, including the 2nd North Mains Sections.

Continuously deteriorating roof conditions after an area has been supported by roof bolts and screening causes pressure on the supports as demonstrated in the picture. These stresses can cause the screening, bolts and roof to rub together or break under the pressure, potentially causing frictional arcing.

Roof falls are a hazard in the mining industry. The picture to the left was taken in the 2nd North Mains Section after the explosion. The investigation revealed numerous falls in the area that had occurred after it was sealed. Roof fall have been documented to cause frictional arcing.

The remains of a concrete block wall after being struck by the forces of the explosion. It is still possible to see some of the blocks strewn around the area.

Damage to the roof supports (pie pans, roof bolts and plates) from the forces of the explosion. There is a roof fall in the foreground.

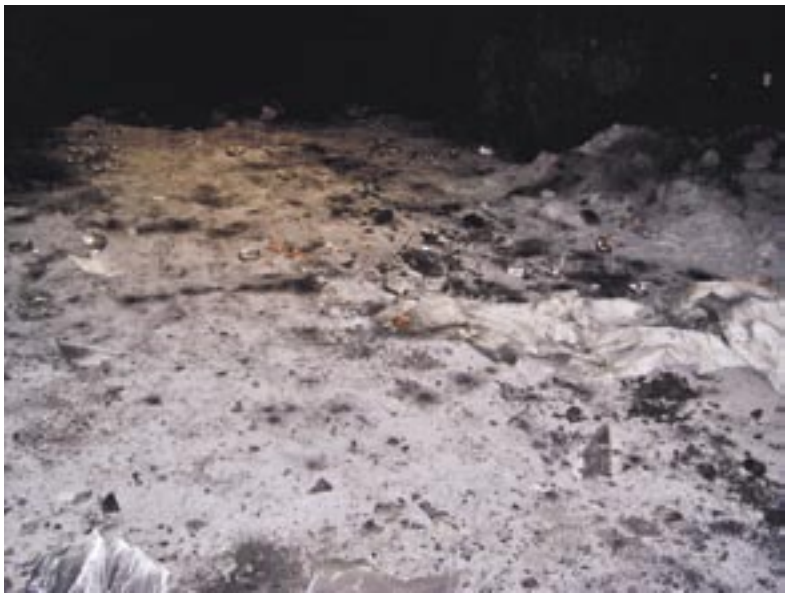
During the investigation the marks in the roof pictured at the left drew much attention. The "anomaly," as it became known, was later determined to be a fossil.

Damaged charging station located in the mains outby the sealed area.

Area inby the Omega Block seals after the explosion. Debris is scattered over the entire area and a thick layer of soot covers everything.

Damaged 2nd Left belt drive. The drive was located at 58 block, approximately the location where the miners were forced to abandon their first rescue attempt.

Ventilation overcast destroyed by the forces of the explosion.



Discarded pieces of the 2nd Left crews SCSR's were found in the #7 entry at about the eleven block. The picture indicates all the miners donned their rescuers at the same time at this location.

The forces of the explosion completely destroyed the Omega Block seal. Fine powder and dust was all that remained of most of the seal material.

Discarded SCSR found in the 2nd Left Section.

Outby view of the barricade constructed by the 2nd Left crew in an attempt to isolate themselves from the contaminated mine atmosphere.

View of the barricade from the inby side.

Sledge hammer used by the 2nd Left crew to signal their location to the surface.

Roof bolt the 2nd Left crew hit to signal the surface of their location.

General Information
International Coal Group

On January 2, 2006, the International Coal Group (ICG) headquarters was located at 2000 Ashland Drive, Ashland, Kentucky 41101. The company was formed in May of 2004 when Wilbur Ross led a group of investors who bought many of the assets of Horizon Natural Resources in a bankruptcy auction. Subsequently the company purchased the assets of Anker Energy and completed a merger agreement with Coal Quest.

The executive staff of ICG was:

Bennett K. Hatfield
: President, Chief Executive Officer and Director. Previously Executive Vice President and Chief Operating Officer at Massey Energy Company.

Charles Snavely
: Vice President, Planning and Acquisitions. Previously served in various management positions at Massey Energy Company.

William Campbell
: Vice President, Accounting and Treasury. Previously Vice President and Controller at Horizon Natural Resources.

Roger Nicholson
: Senior Vice-President and General Counsel. Previously Vice-President, Secretary and General Counsel at Massey Energy Company.

Samuel Kitts
: Senior Vice President, West Virginia and Maryland Operations. Previously served in various management positions at Massey Energy Company.

William Perkins
: Senior Vice President, Kentucky and Illinois Operations. Previously Vice President and General Manager of Horizon's Kentucky Division.

Michael Hardesty
: Senior Vice President, Sales and Marketing. Previously served in various positions at Arch Coal.

Oren Kitts
: Senior Vice President, Mining Services. Previously President of Massey Coal Services.

ICG held approximately 315 million tons of metallurgical coal reserves and approximately 572 million tons of steam coal reserves. It also reported owning or controlling 707 million additional tons of coal reserves that did not yet qualify as commercially viable coal reserves under SEC rules.

The company's overview highlighted 11 operations located in West Virginia, Kentucky and Maryland, nine of which were part of the Wolf Run Mining Company subsidiary. However, a run of the Mine Safety and Health Administration's data retrieval system indicated ICG owned and operated 31 additional operations under seven other subsidiaries.

General Information
Wolf Run Mining Company

As of January 2, 2006, the Wolf Run Mining Company was a wholly owned subsidiary of ICG. MSHA listed nine operations as subsidiaries of Wolf Run Mining Company. Some of the nine operations listed appear to have been independent operations at one point in time, but were part of Anker Energy at the time of purchase. Coaldat shows an additional operation, Spruce Fork Mine #1, located in Upshur County, West Virginia, as a subsidiary of Wolf Run Mining Company. MSHA's database listed the operation as an abandoned subsidiary of Anker Energy. The Spruce Fork Mine produced 249,855 tons of coal with 91 employees in 2005. It is unclear whether the mine was ever active after ICG purchased Anker.

MSHA's database includes the following information:

Mine Name	State	Fed ID	Type	Status	Empl	Tons
Steyer	MD	1800724	Und.	Temp. Idle	N/A	N/A
Sentinel	WV	4604168	Und.	Non-Prod.	70	147,035
Baybeck Prep.	WV	4608364	Prep	Active	9	N/A
Stoney River	WV	4608631	Und.	Non-Prod.	21	45,464
Sentinel Prep	WV	4608777	Prep.	Active	10	N/A
Sago	WV	4608791	Und	Active	141	507,775
Eccles Refuse	WV	4609023	Surf.	New	N/A	N/A
Sycamore #2	WV	4609060	Und.	Active	38	68,758
Imperial	WV	4609115	Und.	Active	N/A	N/A

General Information
Sago Mine

The mine was opened on August 1, 1999 by the BJM Coal Company as Spruce #2 Mine. It was purchased by Anker Energy on January 10, 2002. It is unclear from the Mine Safety and Health Administration (MSHA) data when the name was changed, however, the federal identification number, 4608791, has remained the same since the mine was first operational. The mine was operated by the Wolf Run Mining Company as of January 11, 2002. It was subsequently purchased by the International Coal Group.

The Sago mine is located approximately six miles outside of Buckhannon, Upshur County, West Virginia. The mine is ventilated using a 400 horsepower blowing fan manufactured by Joy. The mine accesses the Middle Kittanning Coal Seam in a box cut development through five entries driven level with the seam.

There were a total of 20 seals separating the old mine from the active operation. These seals were reportedly constructed of solid concrete blocks or packsetters.

Acknowledgments

Participating Mine Rescue Teams

LOVERIDGE MINE

Robert Hovatter
Gary Hayhurst
James Clendenen
Richard Shockley
Wayne Conaway
Leslie Rich Cosner
Nick A Tippi
Donald A. Jack
Charles P. Layman

McELROY MINE

Danny E. Beyser
Dennis Crow
Kelvin Jolly
James Klug
Robert Rohde
Michael Clark
James A. Smith
Randy Clark
Jack Price
William Blackwell

EIGHTY-FOUR MINING COMPANY

Don Krek
Dale Tiberie
Richard Gindlesperger
Kenneth Clark
Robert Volpe
Michey Miskiewicz
Adrian Gordon
John Stowinsky
Dan Puckey
Brad DeBusk

ROBINSON RUN MINE

Sherman Goodwin
Jeff Bienkoski
Craig Carpenter
Alfred Bell
Mark Koon
Larry Tenney

SHOEMAKER MINE

Silas Stavischeck
Glenn McWhorter
Clff Ward
Charles E. Fisher
Okey Rine
Ted Hunt
Robert Haines
Shan Michener
Jim Jack

BLACKSVILLE 2

Jim Ponceroff
David Rush
Richard Tolka
Robert Wade
Lonny Myers
Tony Casini

ENLOW FORK

Dennis Cole
Ron Henry
Bob Gross
Shawn Dewitt
Dave Leverknight
Terry Winland
Bill Whipkey

BAILEY

Larry Cuddy
Dennis Vicinell
George Joseph
Mike Spears
Kevin Williamson
Dave Cass
Bob Calhoun
Gene Menozzi

MSHA

STATE OF WEST VIRGINIA

BARBOUR COUNTY

Names not provided

TRI-STATE COAL

Names not provided

VIPER MINE

Names not provided

Mine Safety and Health Administration

Ray McKinney
Kevin Stricklin
Allen McGilton
Ron Postalwait
Jim Satterfield
Ken Tenney
Argel Vanover
Carlos Mosley
Bill Ponceroff
Ron Wyatt
Greg Fetty
Thomas Hlavsa
Willie Spens
Jerry Johnson
Ed Parrish
Frank Thomas
Ron Tulanowski
Richard Herndon
Mike Stark
Jan Lyall
Charles Pouge
Ronald Hixon
Cheryl McGill
Richard Gates
Denny Swentoski

West Virginia Office of Miners Health, Safety and Training

Doug Conaway
John Collins
Barry Fletcher
Jeff Bennett
John Scott
John Hall
Clarence Dishman
Eugene White
Bill Tucker
Mike Rutledge
Randy Smith
Jim Hodges

United Mine Workers of America

Cecil E. Roberts	International President
Daniel J. Kane	International Secretary-Treasurer
Dennis O'Dell	Administrator, Department of Occupational Health and Safety
Timothy Baker	Deputy Administrator, Department of Occupational Health and Safety
Judy Rivlin	Associate General Counsel
Ron Bowersox	International Representative
Gary Trout	International Representative
Max Kennedy	International Representative
Butch Oldham	International Representative
Mark Cochran	International Representative
Dennis "Turk" Bailey	International Representative
Silas "Sam" Stavischeck	International Representative
Marty Hudson	Executive Assistant to the President
Robert Scaramozzino	Administrator, President's Office
James Lamont	Executive Assistant to the Secretary-Treasurer
Philip Smith	Director, Communications Department
David Kameras	Communications Coordinator
Mike Caputo	International Representative
Jack Rinehart	International Representative
Jim Shifflett	International Representative

Appendices

1. Mine Map, showing:
   Portion of North Mains
   1st Left Section
   2nd Left Parallel Section
   2nd North Mains Section — sealed area
2. Pre-shift report Jan. 2, 2006 1st Left Section
3. Pre-shift report Jan. 2, 2006 Numbers 1-3 track and belt
4. Pre-shift Report Jan. 2, 2006 2nd Left Parallel Section
5. Dispatcher's Report Jan. 2, 2006
6. Mine Maps
   A. Ventilation of the active areas of the mine prior to Dec. 11, 2005 air change.
   B. Ventilation of seals prior to Dec. 11, 2005 air change.
7. Ventilation report Dec. 11, 2005 Completed seals (North Mains) and made air change.
8. Mine Maps
   A. Ventilation of the active areas of the mine after the Dec. 11, 2005 air change.
   B. Sketch on a mine map of seal locations, overcasts, brattice walls and direction of ventilation after the completion of the seals.
9. Oct. 12, 2005 Correspondence from Anker West Virginia Mining Co. to MSHA requesting approval for the use of non-hitched Omega Block seals.
10. Oct. 24, 2005 Correspondence from MSHA to Anker West Virginia Mining Co. approving the request to use Omega Block seals.
11. Oct. 12, 2005 Correspondence from Anker West Virginia Mining Co. to MSHA requesting approval to install Omega Block seals in the North Mains. The proposal also outlines the ventilation changes that will be made at the time the seals are completed.
12. Oct. 24, 2005 Correspondence from MSHA to Anker West Virginia Mining Co. approving the request to seal using Omega Blocks and notifying Sago mine management the changes will be added to the mine ventilation plan.
13. Guidelines for the installation of Omega Block seals (five pages)
14. Mine Map Location of the completed seals
15. Methane trending chart—based on methane liberation and the volume of the sealed area. Data collected during the course of the investigation.

16. Jan. 12, 2006 — Memorandum from Monte Hieb, Chief Engineer, West Virginia Office of Miners' Health, Safety and Training (WVOMHST) to Doug Conaway, WVOMHST Director, stating his determination regarding the cause of the explosion. (two pages)

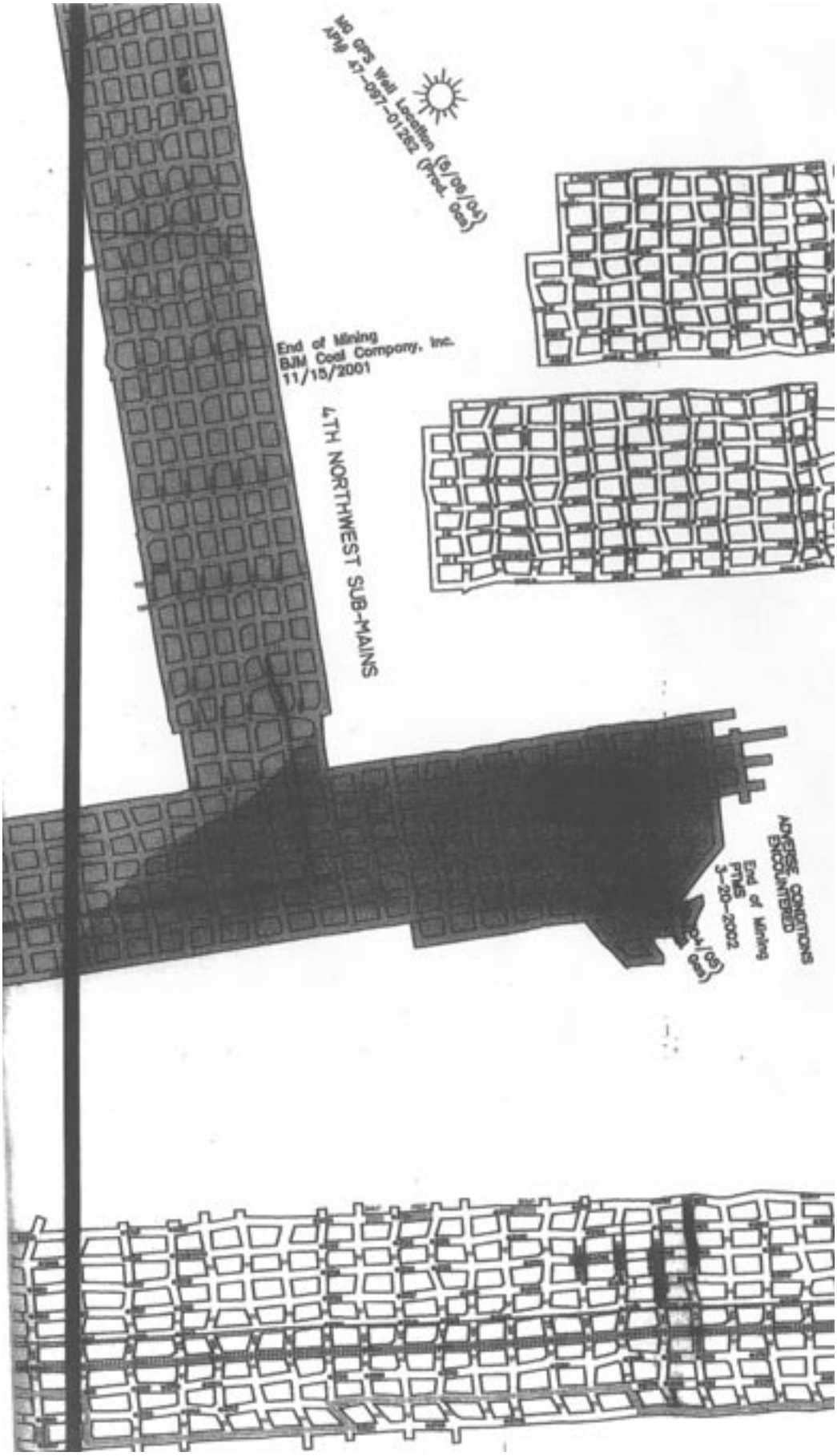
17. Topographical map showing lightning strikes and their proximity to the sealed area.

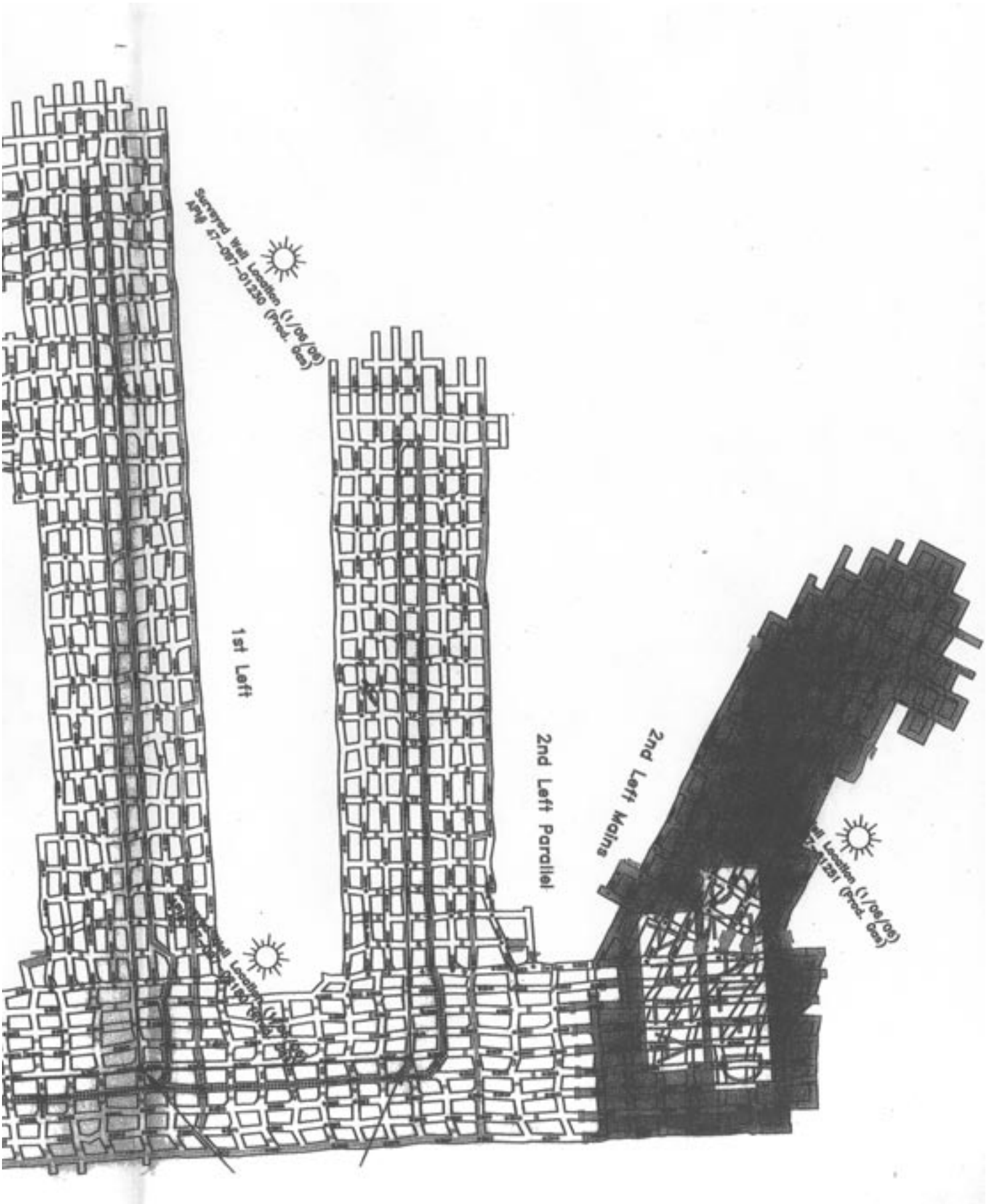
18. Accident overview 1999-2006
    Fatal overview 1999-2006

19. Violation overview 1999-2006

20. Violation history 2005-2006 (totaled by quarter and by year)
    - Citations/Orders Jan. 1, 2005 - Dec. 31, 2006
    - Citations/Orders by type Jan. 1, 2005 - Dec. 31, 2006
    - Citations/Orders by 30 CFR designation Jan. 1, 2005 - Dec. 31, 2006
    - Citations/Orders by proposed penalty Jan. 1, 2005 - Dec. 31, 2006

Appendices


MG GPS Well Location (5/08/04)
API# 47-097-01262 (Proj. Coal)
End of Mining
BJM Coal Company, Inc.
11/15/2001
4TH NORTHWEST SUB-MAINS
ADVERSE CONDITIONS
ENCOUNTERED
End of Mining
PTMS
3-20-2002


1st Left
2nd Left Parallel
2nd Left Mains

Use Indelible Pencil or Ink

PRESHIFT-MINE EXAMINER'S REPORT

Report shall be signed when made

Date of Examination 1-2-06 20 ___ Section or Area Examined 1-Left
Time of Examination: from 4:20 a.m. or p.m. to 4:50 a.m. or p.m.
Was this report phoned to outside: Yes ___ no ___
By whom Terry Holmes Time ___ A.M. ___ P.M.
Report received by Owen Jones
(Signed)

Violations and other Hazardous Conditions Observed and Reported

	Location	*Violation or Hazardous Condition*	*Action Taken*
1.	entry	none obs	
2.	entry	none	
3.	entry	none	
4.	entry	none	
5.	entry	none	
6.	entry	none	
7.	entry	none	
8.	entry	none	
9.			
10.			

Air Measurements

Location	*CFM*	*Location*	*CFM*
1,0,B	14,510		
Ret CH4	.0%		
Ret O2	20.9%		
		1,2,0ll 1,2,jb.	

Remarks:
2-N/B 4-N/B
5, 6, 7, needs cleaned
Section and charger set at Exam time

This is to certify that: (a) This section of the mine was properly examined by me, (b) all violations of the W. Va. Mining Laws and the Federal Coal Mine Health and Safety Act of 1969 and other unsatisfactory conditions and practices observed by me are listed in this report.

Signed By	Preshift-Mine Examiner		Certificate No.	Assistant Foreman	Certificate No.
Countersigned	Mine Manager Mine Foreman				
	Assistant Foreman				
Owen Jones		36860		Superintendent or Assistant	

or ink

PRESHIFT-MINE EXAMINER'S REPORT

Report shall be signed when made

Date of Examination 1-7- 2006 Section or Area Examined Belts Tracks

Time of Examination: from 3:00 a.m. or p.m. to 5:00 a.m. or p.m.

Was this report phoned to outside: Yes ____ no ✓

By whom T. Jonuson - L. Helms Time 5:15 A.M. ____ P.M.

Report received by Carrie Pratt
(Signed)

Violations and other Hazardous Conditions Observed and Reported

	Location	Violation or Hazardous Condition	Action Taken
1.	1-3 Belts	clear	
2.	1-3 Tracks	clear	
3.			
4.	Belt - Head to 15 Block	needs dusted.	Reported
5.	Belt - 5 to 20 Block	- Off side needs dusted.	Reported
6.	Belt -	Off side needs dusted.	Reported
7.	"	20 Block - Water - need bridge.	Reported
8.			
9.	#5 #6 Crosscut.	clear.	
10.			

Air Measurements

Location	CFM	Location	CFM
CH4	0.0		
O2	20.9		

Remarks: Belt & Crosscut. safe to travel

Good air movement

This is to certify that: (a) This section of the mine was properly examined by me, (b) all violations of the W. Va. Mining Laws and the Federal Coal Mine Health and Safety Act of 1969 and other unsatisfactory conditions and practices observed by me are listed in this report.

Signed By	Fred Jones	33073			
	Preshift Mine Examiner	Certificate No.		Assistant Foreman	Certificate No.
Countersigned					
	Mine Manager Mine Foreman				
	Assistant Foreman				
				Superintendent or Assistant	

Use Indelible Pencil or Ink

PRESHIFT-MINE EXAMINER'S REPORT

Report shall be signed when made

Date of Examination 1-2 20 06 Section or Area Examined 2 Left

Time of Examination: from 4:00 a.m. or p.m. to 4:25 a.m. or p.m.

Was this report phoned to outside: Yes ____ no ✓

By whom Brought out Time 5:30 A.M. ____ P.M.

Report received by [signature] (Signed)

Violations and other Hazardous Conditions Observed and Reported

	Location	*Violation or Hazardous Condition*	*Action Taken*
1.	Entry	Clear	
2.	Entry		
3.	Entry		
4.	Entry		
5.	Entry		
6.	Entry		
7.	Entry		
8.	Entry		
9.			
10.			

Air Measurements

Location	*CFM*	*Location*	*CFM*
Last open Rib	11,241		
Return 02	20.9		
Return CH4	0.0%		

1-2-06 J.B.

1-2-06 [signature]

Remarks:

This is to certify that: (a) This section of the mine was properly examined by me, (b) all violations of the W. Va. Mining Laws and the Federal Coal Mine Health and Safety Act of 1969 and other unsatisfactory conditions and practices observed by me are listed in this report.

Signed By [signature] Preshift-Mine Examiner	33073 Certificate No.	Martin Tabe Assistant Foreman	28298 Certificate No.
Countersigned ____ Mine Manager Mine Foreman			
____ Assistant Foreman			
		0000146 Superintendent or Assistant	

Sago Mine
Dispatcher Report

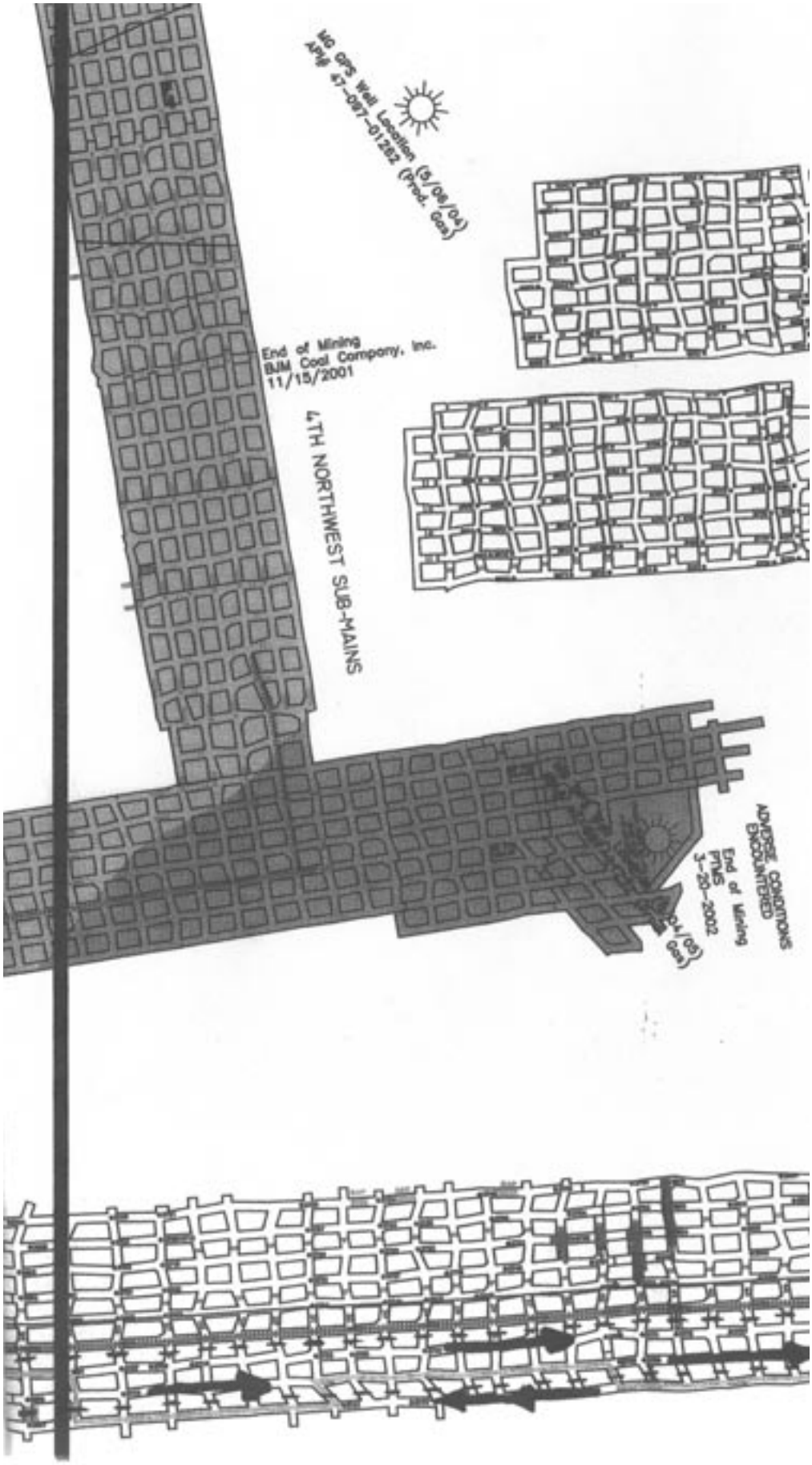
DATE: _____

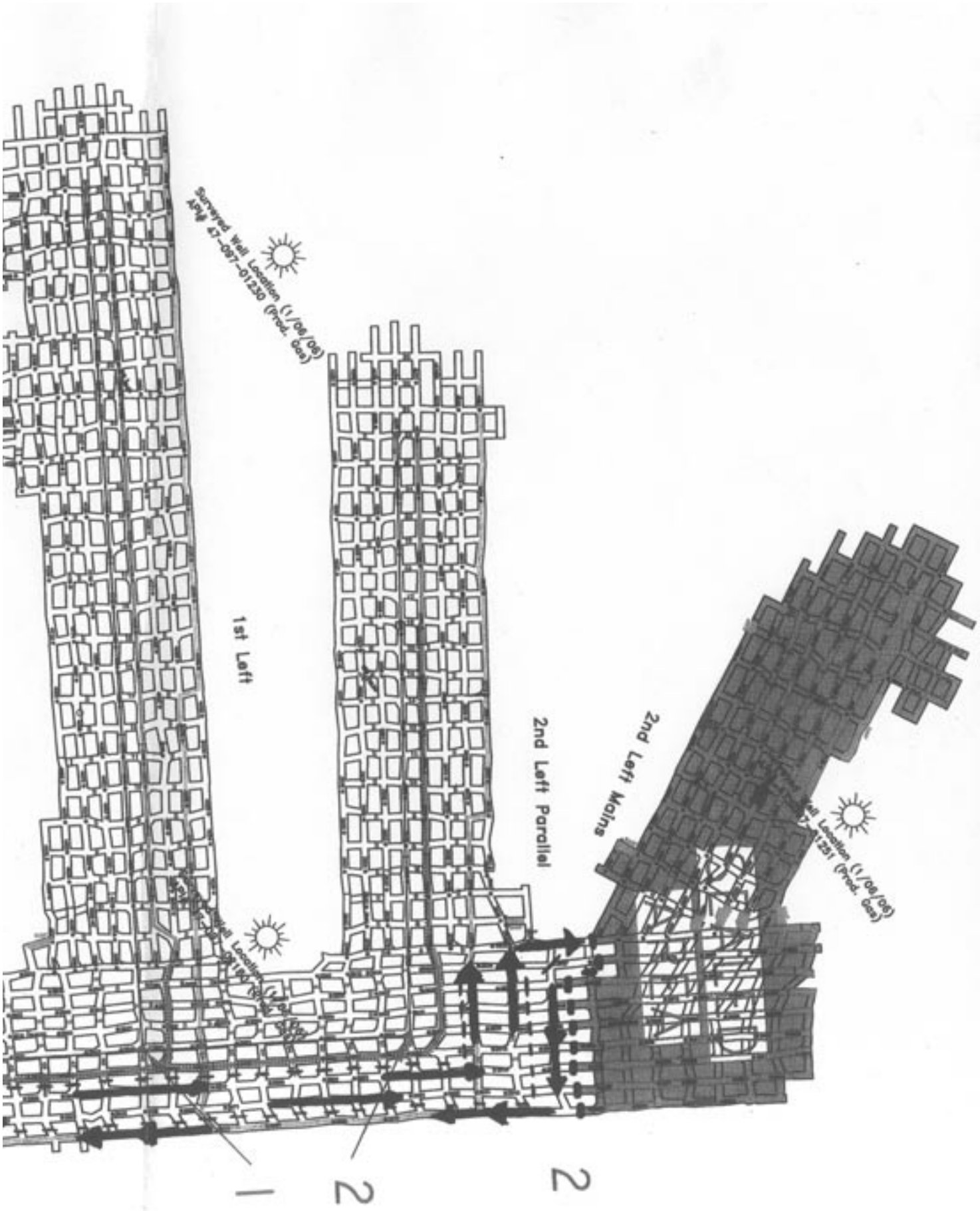
OUND TRIPS TO CLOSE THE DERAIL AFTER THEY GO THROUGH

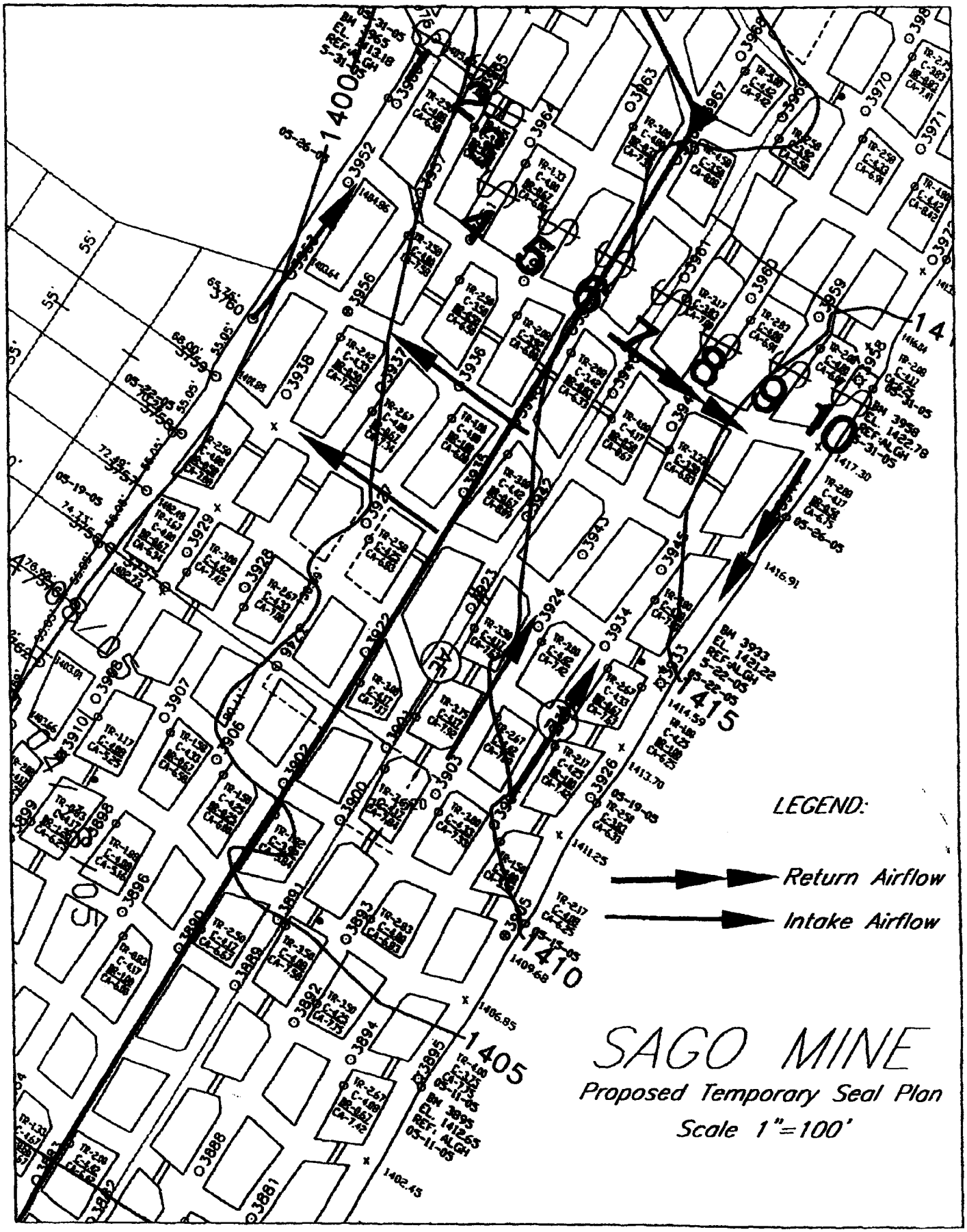
Dispatch From	Dispatch To	Time Of Arrival	Operator Name	NOTES
outside	1 left			
outside	28 block 3 belt			
~~shop~~	5 Head ~~left~~			
outside	2 left			
2 left	outside			
2 left	outside			
outside	2nd left			
outside	1st left			

Copy of dispatcher record for 1-2-06
Ophelia

0000192


MG GPS Well Location (5/08/04)
API# 47-087-01282 (Prod. Gas)
End of Mining
BJM Coal Company, Inc.
11/15/2001
4TH NORTHWEST SUB-MAINS
ADVERSE CONDITIONS ENCOUNTERED
End of Mining
PNS
3-20-2002


1st Left
2nd Left Parallel
2nd Left Mains
1
2
2


LEGEND:
Return Airflow
Intake Airflow
SAGO MINE
Proposed Temporary Seal Plan
Scale 1"=100'

Use Indelible
Pencil or Ink

Weekly Examinations—Week Ending .... 19....

Air Measurements

Volume Cubic Feet Per Minute

Location	Working Face	Main Intake	Main Return	Intake Split	Return Split(s)	Bleeder Split	Last Open Crosscut	Date	Person Taking Air Measurements

Significant

Examination for Hazardous Conditions Including Tests for Methane

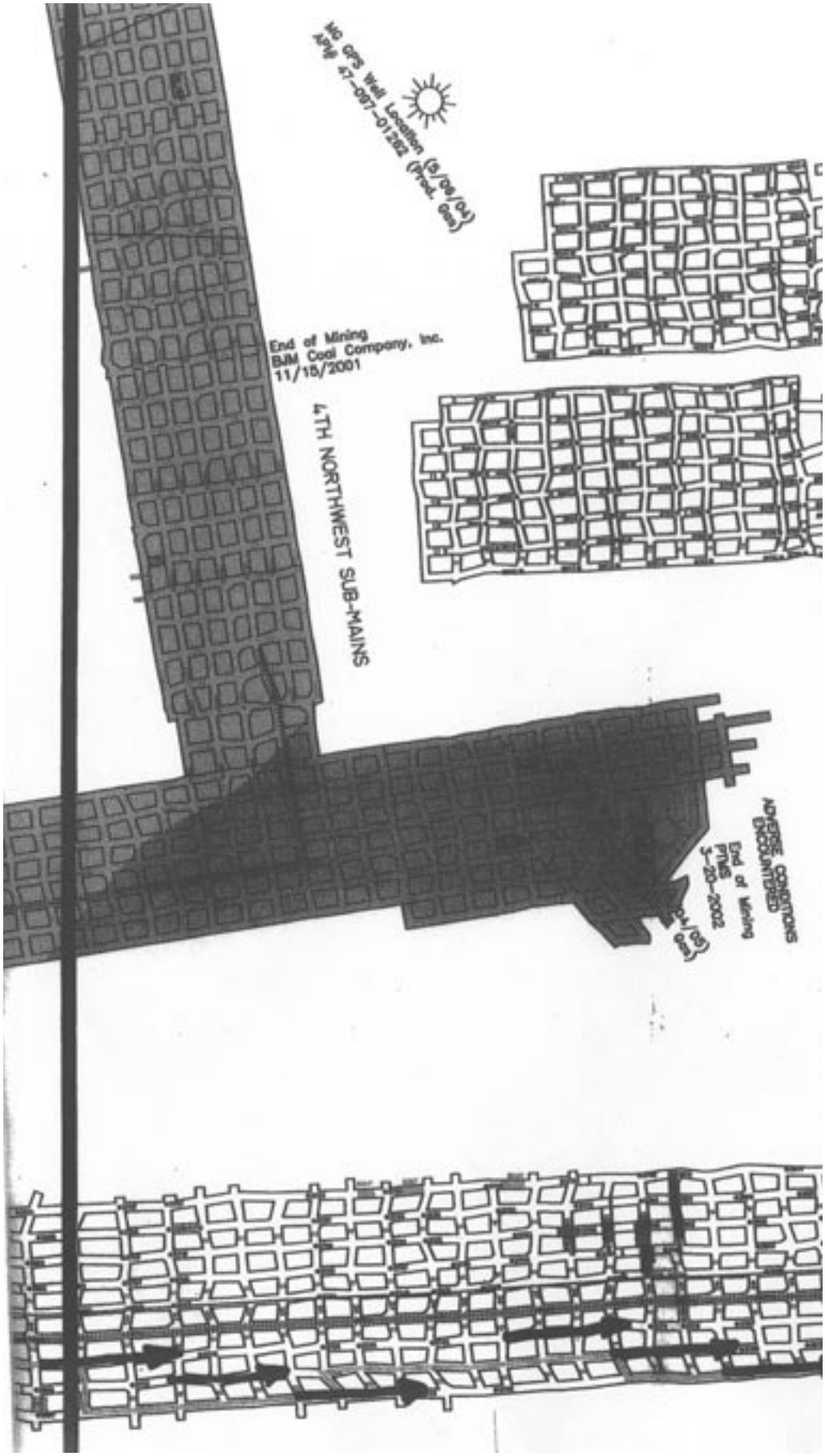
Location	Intake and Return Air Courses Traveled	Hazards Noted	Date	Signature of Examiner
12-11-05 Finished seals on 2 left mains, made air change at 2nd right to make common				[illegible] 2810

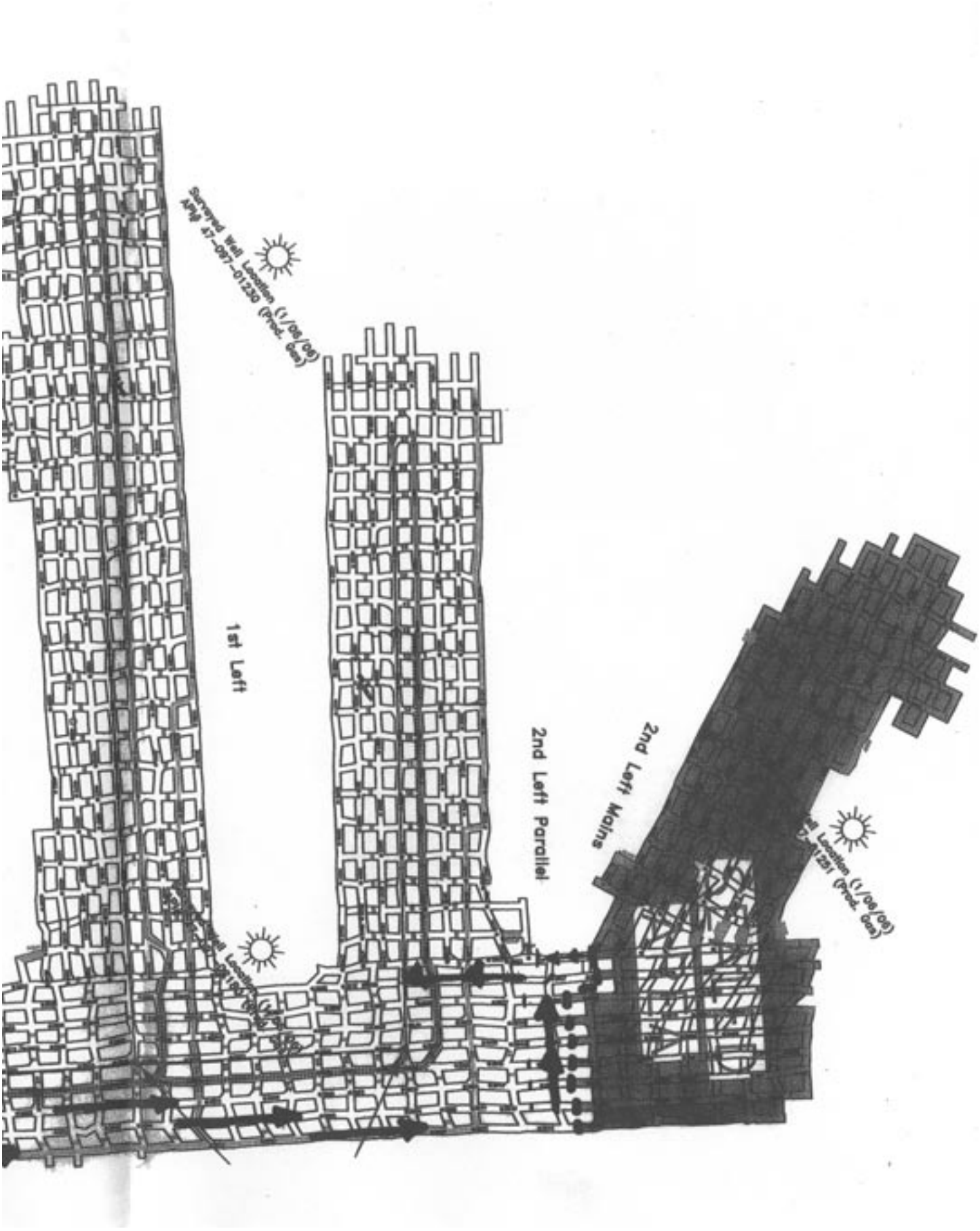
Examination of pillar falls, seals, idle workings, abandoned areas

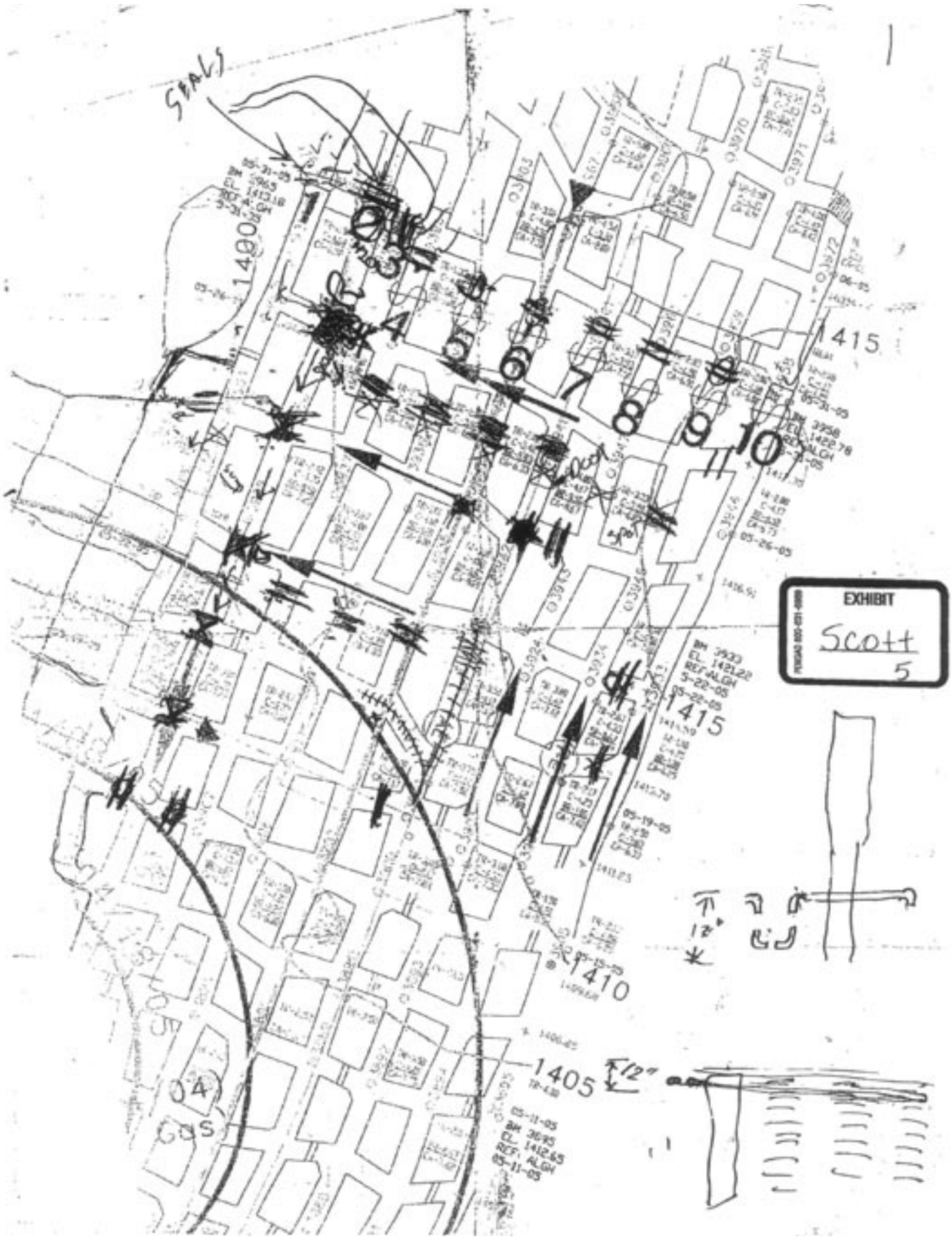
Actions taken

0000111

Signature [illegible signature] Mine Foreman 25812 Certificate No. Signature


MG GPS Well Location (5/08/04)
API# 47-097-01782 (Prod. Gas)
End of Mining
BJM Coal Company, Inc.
11/15/2001
4TH NORTHWEST SUB-MAINS
ADVERSE CONDITIONS ENCOUNTERED
End of Mining
PTMS
3-20-2002


1st Left
2nd Left Parallel
2nd Left Mains


SEALS
1400
1415
1410
1405
EXHIBIT
Scott
5

Anker West Virginia Mining Company
Rt. 9 Box 507
Buckkannon, WV 26201

October 12, 2005

Kevin Stricklin, District Manager
Mine Health and Safety Administrtation
604 Cheat Road
Morgantown, WV 26508
Attn: Tom Hlavsa

RE: Sago Mine's Ventilation Plan Changes

Mr. Stricklin:

Anker West Virginia Mining Company wishes to add an Omega Concrete Block Seal Method and Plan to our current Ventilation Plan for our Sago Mine, MSHA ID # 46-08791. It should be noted, that at this time, we only wish to add the non-hitched style to our plan. (See attached diagrams).

If you have any questions on this matter, please feel free to contact me at 304-471-3300.

Sincerely,

Joe Myers
FOR Al Schoonover
Safety Director

ldition of Omega Seal to 4
lon 8' high by 20' wide
ply

U.S. Department of Labor

Mine Safety and Health Administration
604 Cheat Road
Morgantown, West Virginia 26508

SENT TO AND/OR DISCUSSED WITH FIELD OFFICE:

SURNAME	DATE
Grant/Terry	10/13/2005

REVIEWED BY:

Parrish	10/19/2005
Brooks for TH	10/20/05
Smith	10-20-05
Mosley	10-20-05

UNDERGROUND MINE FILE
RECEIVED 10-24-5
INITIALS aew

OCT 2 4 2005

Mr. Jeffrey K. Toler
Superintendent
Anker WV Mining Company, Inc.
Route 9, Box 507
Buckhannon, West Virginia 26201

Dear Mr. Toler:

The request filed October 12, 2005, and revision filed October 19, 2005, to add an alternative method of seal construction to the ventilation plan for the Sago Mine, I.D. No. 46-08791, has been reviewed. The alternative method seal made with nonhitched-style Omega blocks is approved and will be included in your currently approved mine ventilation plan.

You are reminded that all changes or revisions to the mine ventilation plan, as specified in 30 CFR 75.370(d), must be submitted to and approved in writing by this office before they are implemented.

If you have any questions, please feel free to contact this office.

Sincerely,

Kevin G. Stricklin

Kevin G. Stricklin
District Manager

EParrish:aew

bcc:
Bridgeport F/O (2)
W. Ponceroff
E. Parrish
Health Section
Map File
Main File

PENGAD 800-631-6989 EXHIBIT Scott 1

10

Anker West Virginia Mining Company
Rt. 9 Box 507
Buckkannon, WV 26201

October 12, 2005

Kevin Stricklin, District Manager
Mine Health and Safety Administrtation
604 Cheat Road
Morgantown, WV 26508
Attn: Tom Hlavsa

RE: Sago Mine's Ventilation Plan Changes

Mr. Stricklin:

Anker West Virginia Mining Company wishes to seek approval relative to installing nine mine seals across our North-East Mains in our Sago Mine, MSHA ID # 46-08791.

The mine seals being proposed will be constructed across our North East Mains, just inby the area that will be the future location of the 2nd Mains Unit. The proposed seals will be constructed across the North East Mains area in such a manner that the No. 2-9 seals will be constructed first, with seal numbers 1 and 10 be constructed simultaneously. It should be noted that for a temporary time frame, (not to exceed a four week period after the construction of said seals), that we will course air from a left-to-right direction, (from the number 1 entry towards the number 9 entry), in order to ventilate these seals; however, once we have constructed the necessary overcasts on the future 2nd Left Mains the air flow direction will be switched to a right-to-left direction, (From the number 9 entry towards the number 1 entry). See attached mapping to see air flow direction and ventilation control devices.

If you have any questions on this matter, please feel free to contact me at 304-471-3300.

Sincerely,

Joe Myers
For Al Schoonover
Safety Director

Approval of 2 Left Seals 9

U.S. Department of Labor

Mine Safety and Health Administration
604 Cheat Road
Morgantown, West Virginia 26508

UNDERGROUND MINE FILE
DATE FWD. 10-24-5
INITIALS aew

SENT TO AND/OR DISCUSSED WITH FIELD OFFICE:

SURNAME	DATE
Parrish/Terry	10/13/2005

REVIEWED BY:

Parrish	10/18/2005
Warren	10/19/05
Daily	10-20-05
Mosby	10-20-05

OCT 2 4 2005

Mr. Jeffrey K. Toler
Superintendent
Anker WV Mining Company, Inc.
Route 9, Box 507
Buckhannon, West Virginia 26201

Dear Mr. Toler:

The proposed location and sequence of seal construction across North East Mains and the intentional ventilation change filed October 12, 2005, at the Sago Mine, I.D. No. 46-08791, has been reviewed. The request is approved and will be included as a supplement to the mine ventilation map filed pursuant to 30 CFR 75.372.

You are reminded that this ventilation change must be conducted in accordance with 30 CFR 75.324.

If you have any questions, please feel free to contact this office.

Sincerely,

Kevin G. Stricklin

Kevin G. Stricklin
District Manager

EParrish:aew

bcc:
Bridgeport F/O (2)
E. Parrish
Map File
Main File

Guidelines for installation of Omega Block Concrete Seals

1. All loose material will be removed from the roof, ribs, and floor to accommodate seal construction and supplemental supports. The seals will be constructed at such a location so that a permanent block seal can be installed in front of the omega seal, if required in the future.

2. The seal will be constructed with Omega blocks using one of the following Methods:

   A) Total thickness of 40"
   B) No hitching required.
   C) Joints must be staggered.
   D) A bonding agent (Blockbond #122551), will be used to seal between each layer and joining edges of blocks at least ¼" thick and will be applied to the front and back of the seal.
   E) The Omega blocks will be either be sawed or constructed so as to bring the top blocks to within 2" of the mine roof.
   F) Three rows of wood planks running the entire length of the seal shall be installed across the top of the seal.
   G) Wedges will be placed on 1 Foot centers or less, with an approved sealant used to fill the gaps.
   H) An approved sealant shall be used as full face coating on both sides of the seal.
   I) Seals shall be installed at least 10 feet from the corner of the pillar.
   J) Sample pipes shall be installed as per 75.335.
   K) Water traps will be installed within 12" of the bottom or floor.

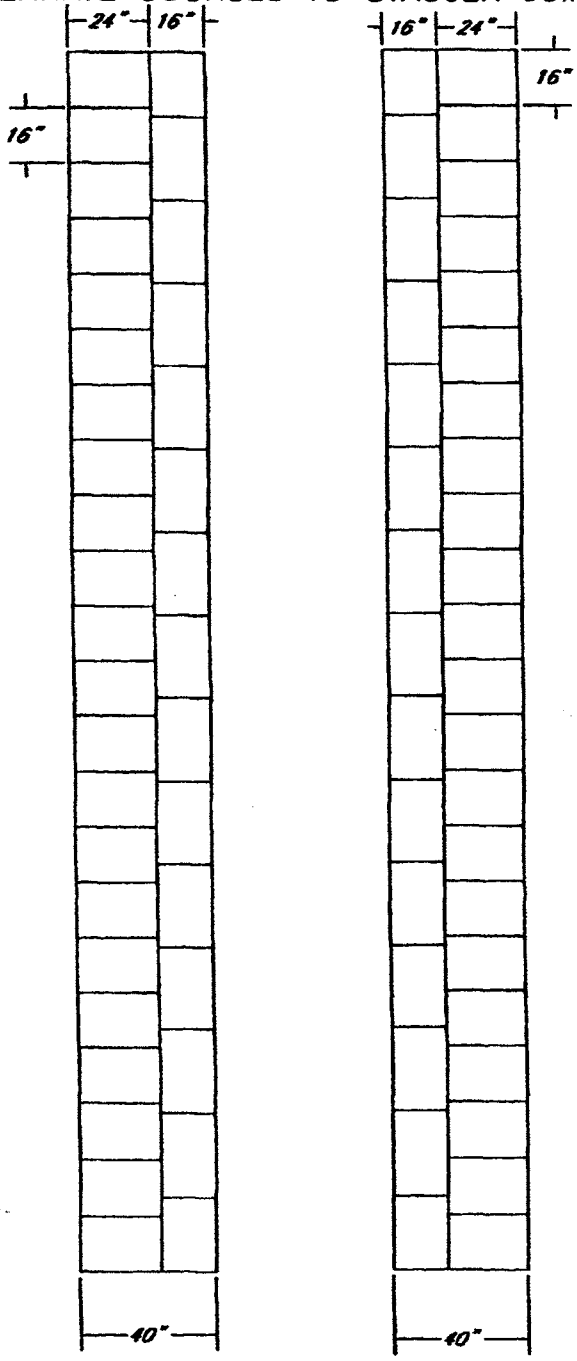
SAGO MINE

40" THICK OMEGA BLOCK SEAL

CONTRUCTION PLAN

FOR USE WITH SEALS UP TO 8 FT HIGH BY 20 FT WIDE

ALTERNATE COURSES TO STAGGER JOINTS

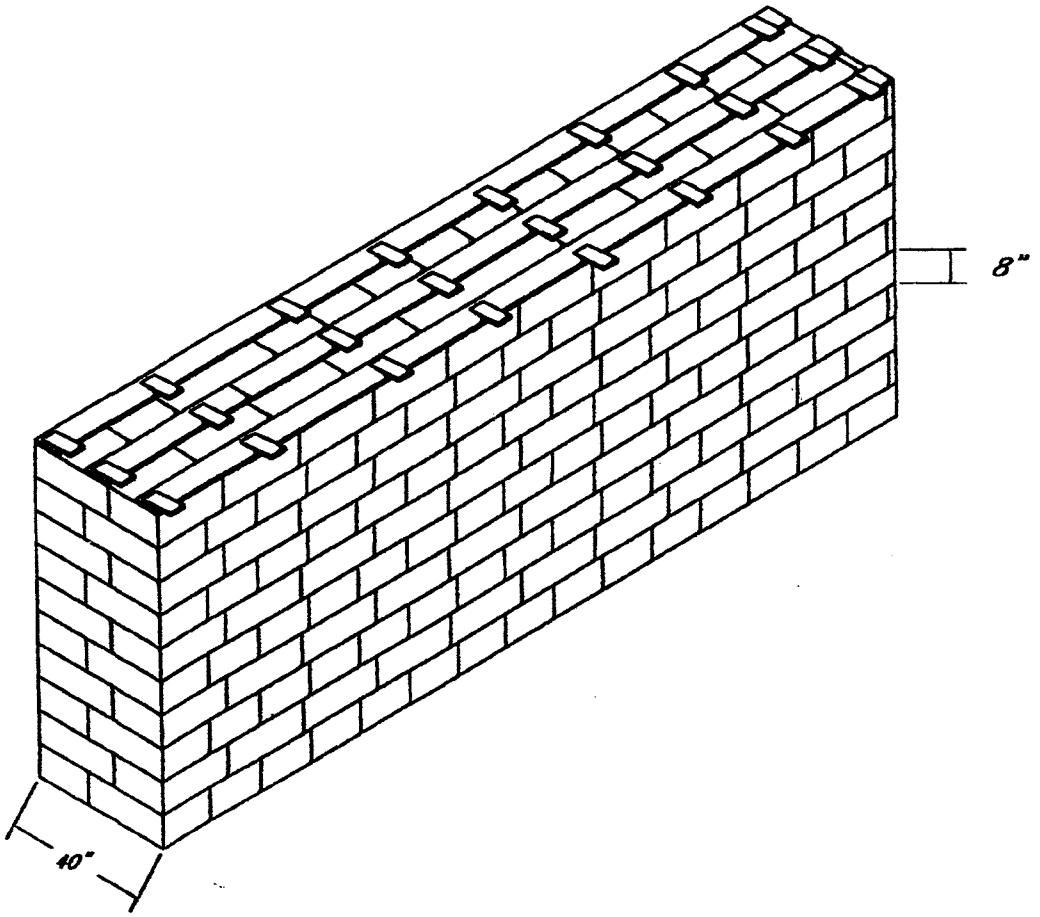


SAGO MINE

40" THICK OMEGA BLOCK SEAL

FOR USE WITH SEALS UP TO 8 FT HIGH BY 20 FT WIDE

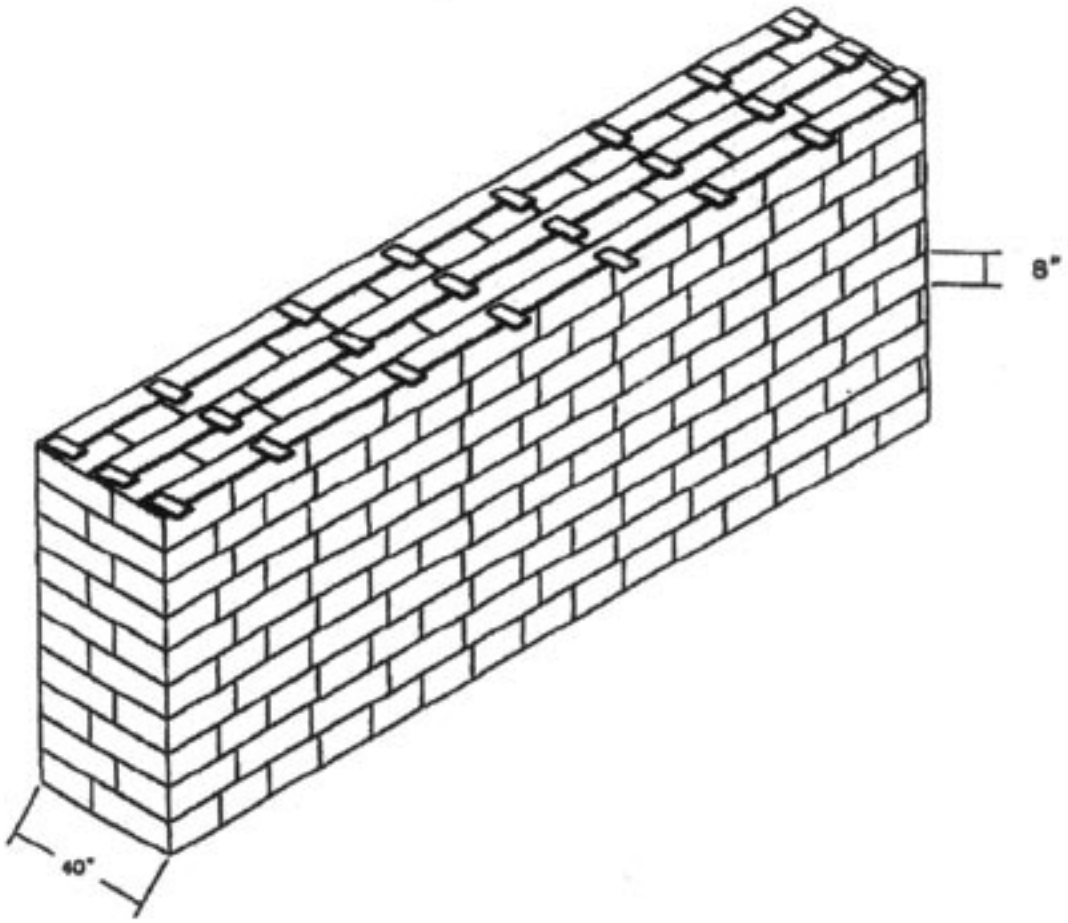
1. Total thickness 40 inches
2. No hitching required
3. Joints must be staggered
4. All joints shall be a minimum 1/4 inch thich and be motared using an approved motar/sealant
5. Three rows of wood planks running the entire length of the seal shall be installed across the top of the seal
6. Wedges will be placed on 1' centers or less with an approved sealant used to fill the gaps
7. An approved sealant shall be used as full face coating on both sides of the seal.



- Seals shall be at least 10 feet from the corner of the pillar
- Sampling pipes shall be installed as per 75.335

40" THICK OMEGA BLOCK SEAL
FOR USF WITH SEALS UP TO 8 FT HIGH BY 20 FT WIDE
NO HITCHING REQUIRED

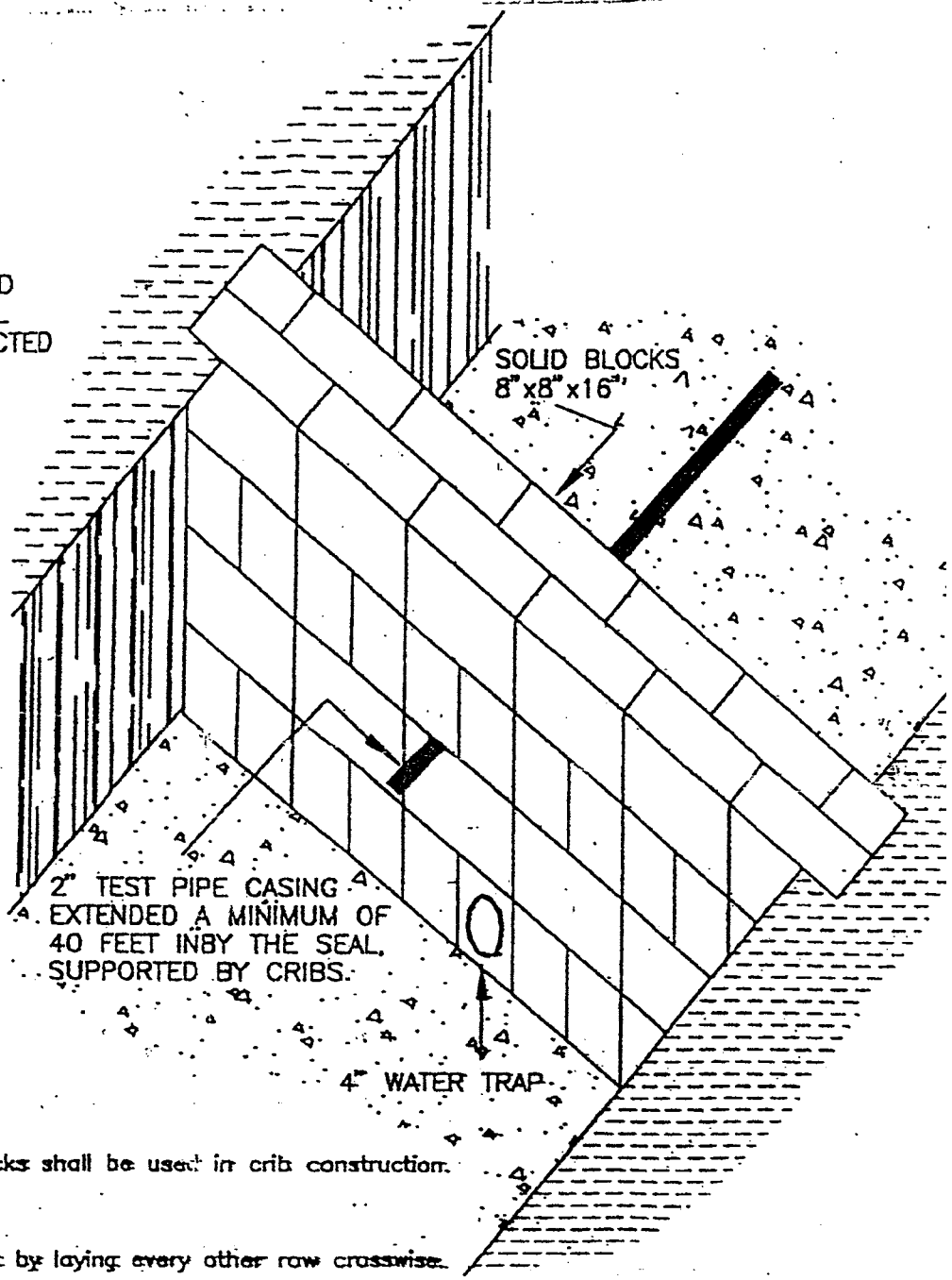
1. Total thickness of completed seal shall be 40 inches
2. No hitching required
3. Joints must be staggered
4. All joints shall be a minimum ¼ inch thick and be motored using "BlockBond"
5. Three rows of wood planks running the entire length of the seal shall be installed across the top of the seal
6. Wedges will be placed on 1' centers or less with "BlocBond" used to fill the gaps
7. "BlocBond" shall be used as full face coating on both sides of the seal.



- seals shall be at least 10 feet from the corner of the pillar
- Sampling pipes shall be installed as per 75.335

METHOD FOR SEALING ABANDONED OR WORKED OUT AREAS

5



BLOCKS TO BE ANCHORED ONE FOOT IN SOLID COAL AND SHALL BE CONSTRUCTED ON SOLID BOTTOM.

TWO ROWS OF BLOCKS WITH CONCRETE MOTAR LINES AND 1/2" PLASTER ON THE OUT-BY-SIDE AND WHERE POSSIBLE ON THE INBY-SIDE.

- A minimum of 30" crib blocks shall be used in crib construction.
- Blocks are to be interlocked by laying every other row crosswise.
- A minimum of two cribs are to be built inby and outby each seal.
- Seals must be built a minimum of 10 feet inby the corner of the coal block.
- All stoppings to be removed in the line of crosscuts inby each set of seals. 1/4" copper tubing is to be installed through the entire length of the 2" test pipe casing.
- Each of the above pipes must be installed in each set of seals. The 2" text pipe casing must be in the seal of the highest elevation. The division office shall be notified before the seals are finished so that the district inspector can check to see if the seals have been constructed to specifications.

Page 1

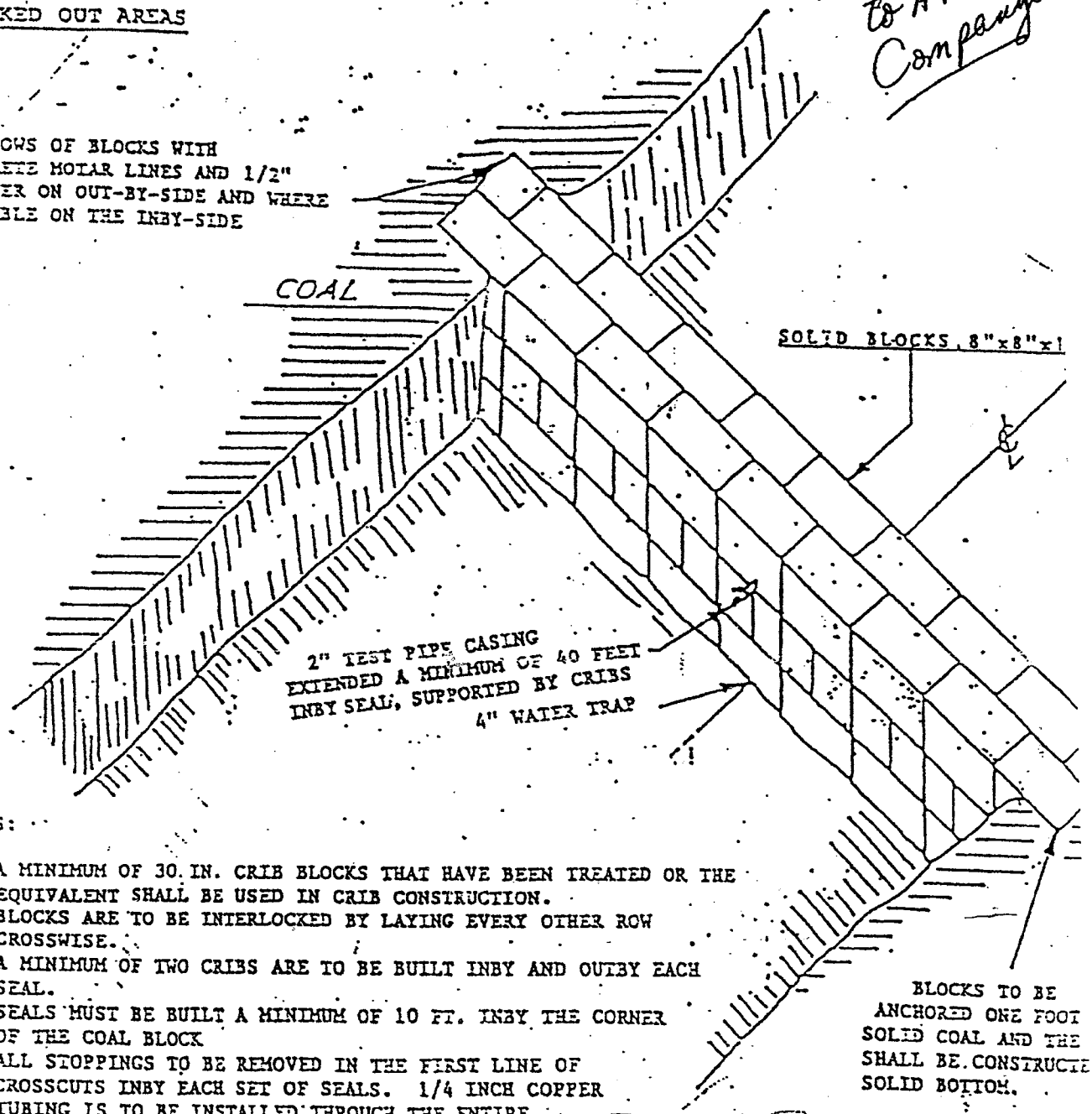
DEPARTMENT OF ENERGY

Division of Mines and Minerals

Effective as of 12/13/85

Distribute to All Companys 6

PLAN FOR SEALING ABANDONED OR WORKED OUT AREAS



IES:

A MINIMUM OF 30 IN. CRIB BLOCKS THAT HAVE BEEN TREATED OR THE EQUIVALENT SHALL BE USED IN CRIB CONSTRUCTION.

BLOCKS ARE TO BE INTERLOCKED BY LAYING EVERY OTHER ROW CROSSWISE.

A MINIMUM OF TWO CRIBS ARE TO BE BUILT INBY AND OUTBY EACH SEAL.

SEALS MUST BE BUILT A MINIMUM OF 10 FT. INBY THE CORNER OF THE COAL BLOCK

ALL STOPPINGS TO BE REMOVED IN THE FIRST LINE OF CROSSCUTS INBY EACH SET OF SEALS. 1/4 INCH COPPER TUBING IS TO BE INSTALLED THROUGH THE ENTIRE LENGTH OF THE 2" TEST PIPE CASING.

EACH OF THE ABOVE PIPES MUST BE INSTALLED IN EACH SET OF SEALS. THE 2" TEST PIPE CASING MUST BE IN THE SEAL OF THE HIGHEST ELEVATION AND THE WATER TRAP IN THE SEAL OF LOWEST ELEVATION.

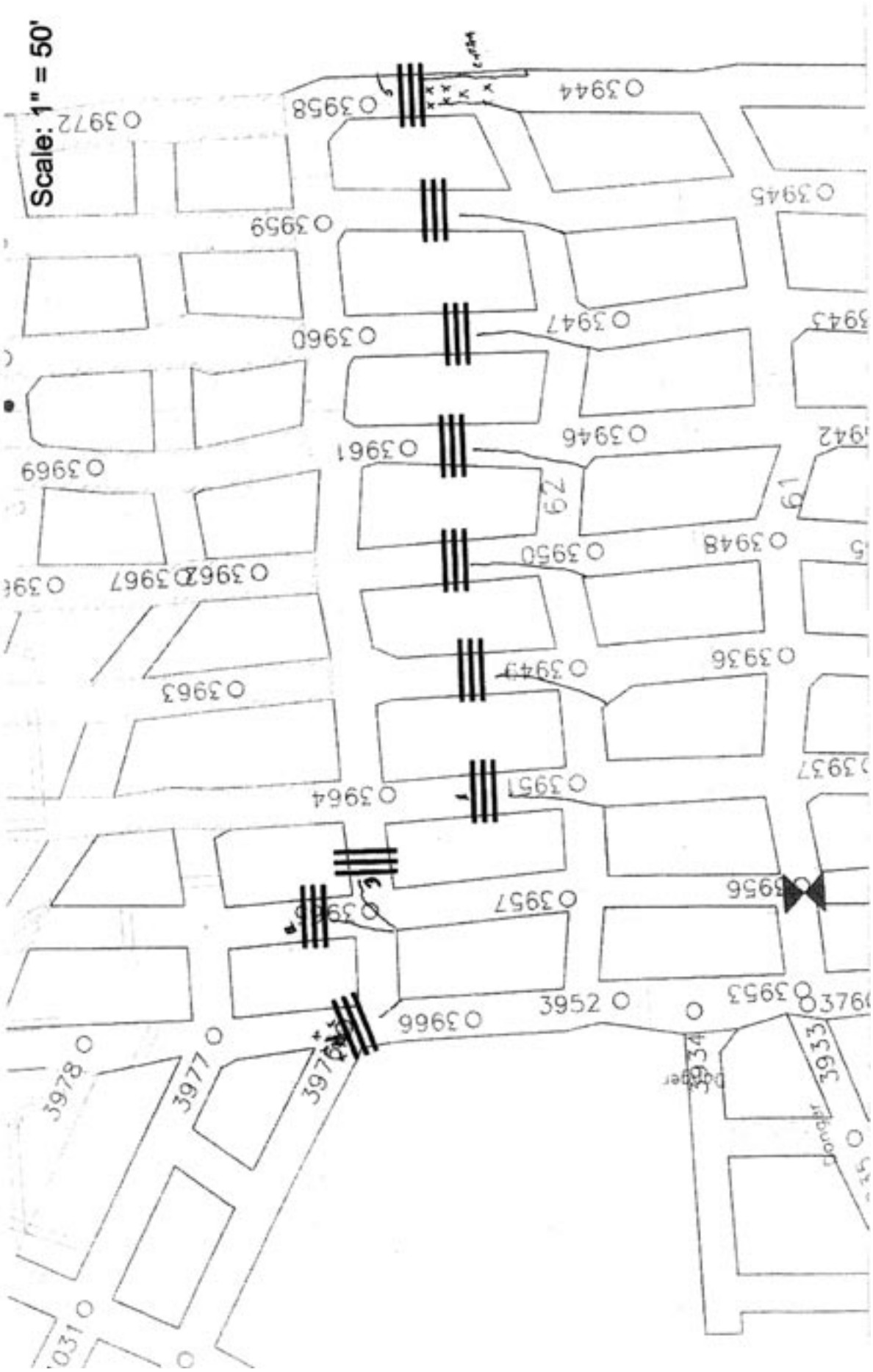
HE DIVISION OFFICE SHALL BE NOTIFIED BEFORE THE SEALS ARE FINISHED SO THAT THE DISTRICT INSPECTOR CAN CHECK TO SEE IF THE SEALS HAVE BEEN CONSTRUCTED TO SPECIFICATIONS.

COMPANY: _____

MINE: _____

SIGNATURE OF COMPANY OFFICIAL & T

PAGE 2


Scale: 1" = 50'
3972
3958
3944
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3950
3948
3963
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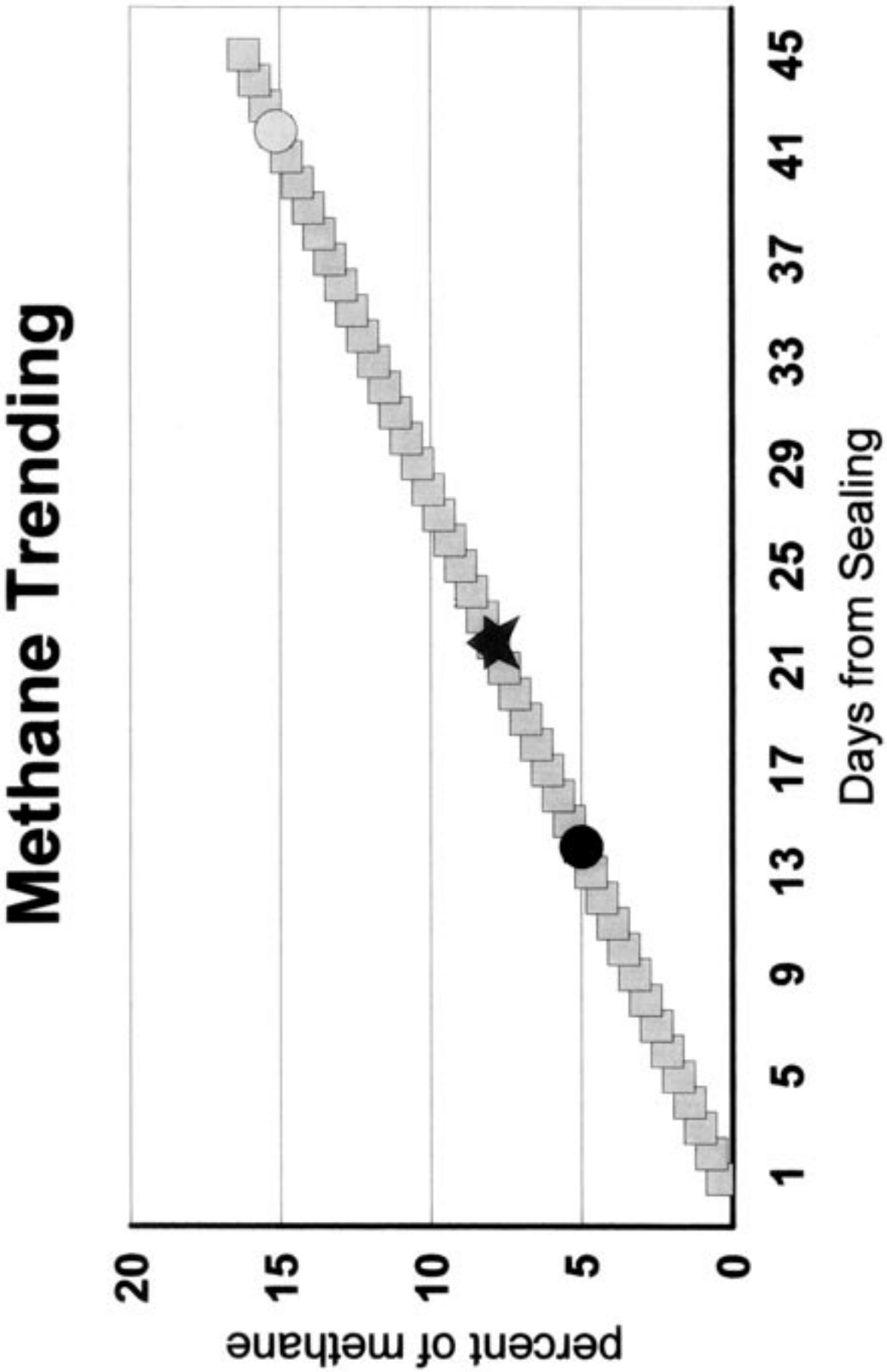

Methane Trending
percent of methane
20
15
10
5
0
1
5
9
13
17
21
25
29
33
37
41
45
Days from Sealing

West Virginia Office of Miner's Health, Safety, and Training

142 Industrial Drive
Oak Hill, WV 25901

PH 304-469-8100
FX 304-469-4059

MEMO

TO: Doug Conaway
FROM: Monte Hieb
DATE: January 12, 2006
SUBJECT: Timing of explosion corresponds to lightning strike

Yesterday with the help of John Scott, Marshall Robinson (Allegheny Land Surveying), and Kevin Hedrick (MSHA) it was determined that the time of the explosion January 2, 2006 at Sago Mine occurred at **6:26:35 am.**

This determination was made by comparing the time on the CO monitoring computer at Sago to a GPS clock (precise actual time). The Sago CO computer clock was determined to be running 4 minutes 56 seconds (00:04:56) ahead of the GPS clock.

John Scott advised that the first spike on the **CO computer log** for January 2, 2006 was 51 ppm which occurred at 6:31:31 am. Subtracting the time correction places the actual time of this event at **06:26:35 am**.

This corresponds precisely with the timing of two nearly simultaneous **lightning strikes** approx. 2 miles apart, located on the attached map. The strongest of these, recorded by Vaisala (StrikeNet), was reported to be a +101.0 kA hit at LAT 38.926, LONG -80.233 at **06:26:35.680 am** on January 2, 2006. This is the location where Sago engineer Kermit ~~Melvin and myself found the lightning-struck tree last Friday (see Photo 1).~~

A second, smaller strike of +38.8 kA occurred nearly simultaneously nearby at LAT 38.897, LONG -80.231 at 06:26:35.522 am. This one left no obvious physical damage on the ground or treetops, but prevalent minor tree damage from prior early snows last fall may have obscured evidence of a minor strike.

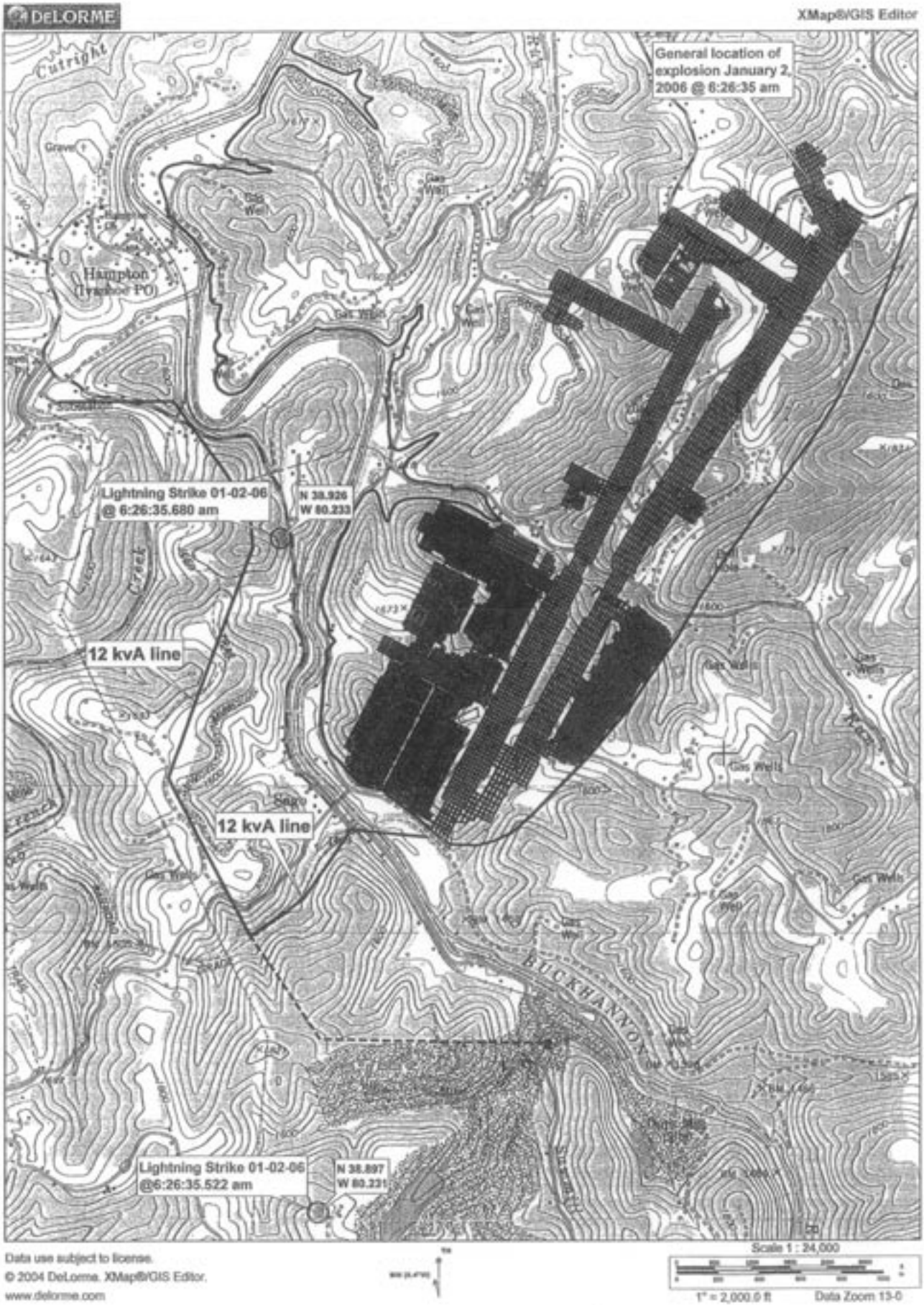
The 06:26:35 am timeframe for the explosion also seems to be corroborated by a subtle **seismic event** recorded by a USGS seismic station located at WVGES at Mont Chateau and detected by Martin Chapman, a geophysicist at the University of Virginia. He places the time at approximately **06:26:38 am +/- 3 sec**. The proof for this has not yet been independently verified.

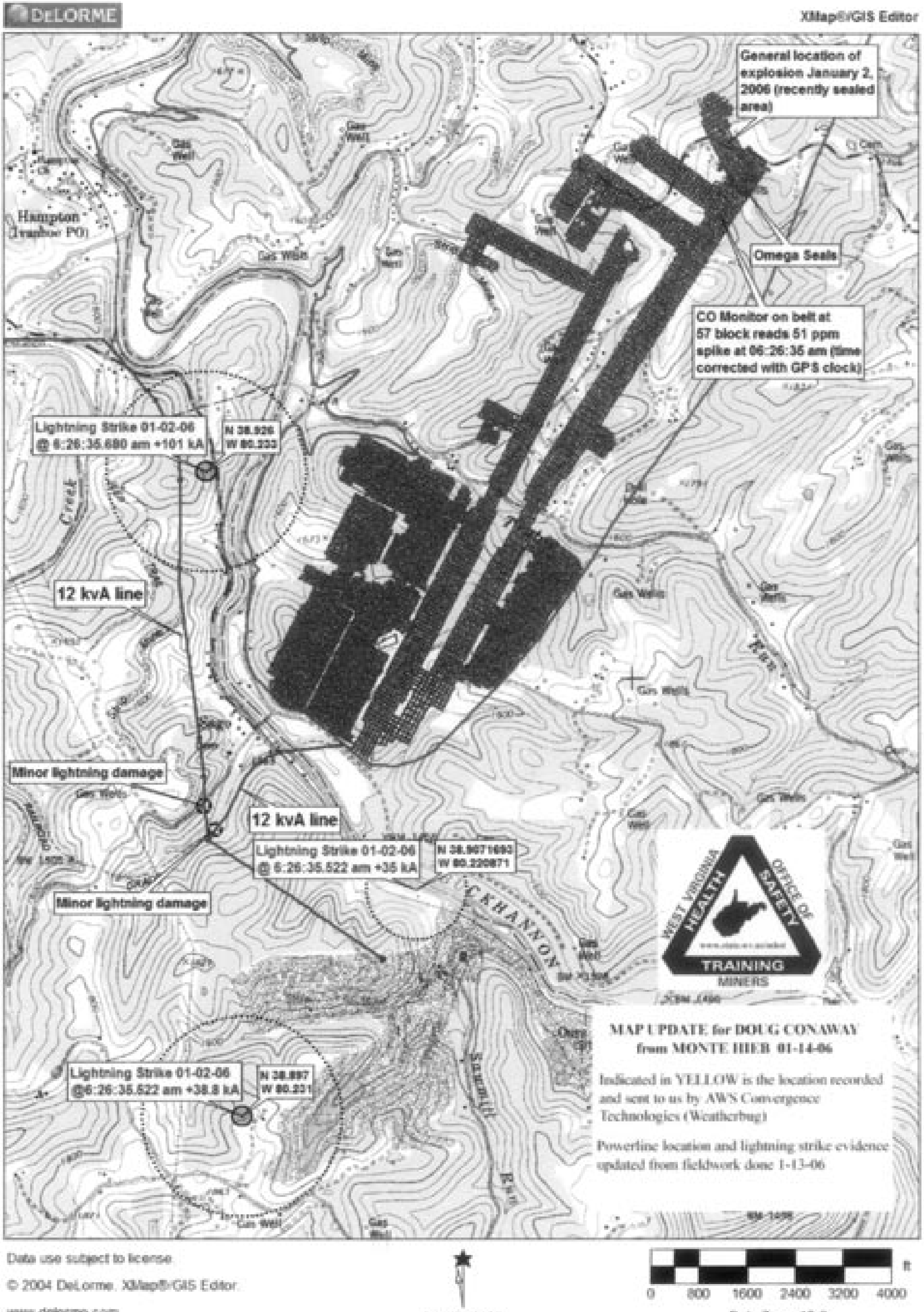
Unless evidence is uncovered in the future which casts doubt on the facts as stated above, there is convincing circumstantial evidence that the explosion at Sago Mine on January 2, 2006 was directly related to one or both of the lightning strikes recorded at 06:26:35 am, both of which occurred on the opposite side of the Buckhannon River from Sago Mine.

Notably, a 12 kvA powerline passes within about 500 feet of the +110 kA lightning strike location (see map, attached). This line begins at the Allegheny Power substation on French Creek and supplies the power to the Sago preparation plant and Sago Mine.

Because of these findings, it is suggested that we begin taking a look at the conductive and grounding systems of the 12 kvA transmission line to explore the possibility that a power surge may have entered Sago Mine by such means. Pipelines, phone communication lines, and other similar structures at this location should also be examined.

Photo 1. Poplar tree very recently hit by lightning and in close proximity to +110 kA hit recorded by Vaisala (StrikeNet) at LAT 38.926, LONG -80.233 at 06:26:35.680 am on January 2, 2006, Photo by Kermit Melvin, January 6, 2006.


DeLORME
XMap®/GIS Editor
General location of explosion January 2, 2006 @ 6:26:35 am
Lightning Strike 01-02-06 @ 6:26:35.680 am
N 38.926
W 80.233
12 kvA line
12 kvA line
Lightning Strike 01-02-06 @6:26:35.522 am
N 38.897
W 80.231
Data use subject to license.
© 2004 DeLorme. XMap®/GIS Editor.
www.delorme.com
Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 13-0


DELORME
XMap®/GIS Editor
General location of explosion January 2, 2006 (recently sealed area)
Omega Seals
CO Monitor on belt at 57 block reads 51 ppm spike at 06:26:35 am (time corrected with GPS clock)
Lightning Strike 01-02-06 @ 6:26:35.680 am +101 kA
N 38.926 W 80.233
12 kvA line
Minor lightning damage
12 kvA line
Lightning Strike 01-02-06 @ 6:26:35.522 am +35 kA
N 38.9071693 W 80.220871
Minor lightning damage
Lightning Strike 01-02-06 @6:26:35.522 am +38.8 kA
N 38.897 W 80.231
Hampton (Ivanhoe PO)
WEST VIRGINIA HEALTH SAFETY OFFICE OF MINERS TRAINING
MAP UPDATE for DOUG CONAWAY from MONTE HIEB 01-14-06
Indicated in YELLOW is the location recorded and sent to us by AWS Convergence Technologies (Weatherbug)
Powerline location and lightning strike evidence updated from fieldwork done 1-13-06
Data use subject to license.
© 2004 DeLorme. XMap®/GIS Editor.
www.delorme.com
MN (8.4° W)
0 800 1600 2400 3200 4000 ft
Data Zoom 13-0

SAGO MINE

Lost Time Accidents Compaired to National Data

Year	Operator Injuries	Contractor Injuries	Mine Incident Rate	National Incident Rate
1999	0	0	0	8.25
2000	9	0	17.22	8.29
2001	5	0	11.83	7.13
2002	0	4	0	7.13
2003	Mine	was	not	operating
2004	8	0	15.9	5.68
2005	14	2	10.22	5.15
2006	6	2	5.91	4.99

Fatal Accident Compared to National Data

Year	Operator Fatal Accidents	Contractor Fatal Accidents	Mine Incident Rate	National Incident Rate
1999	0	0	0	0.0362
2000	0	0	0	0.0472
2001	0	0	0	0.076
2002	0	0	0	0.0329
2003	Mine	was	not	operating
2004	0	0	0	0.0356
2005	0	0	0	0.0325
2006	12	0	13.94	0.1619

SAGO MINE

Citation / Orders Type Issued by Year Penalty

Year	103(k)	104(a)	104(b)	104(d)(1)	104(d)(2)	107(a)	314(b)	Proposed Penalty	Assessed Penalty	Amount Paid
1999	0	18	0	0	0	0	0	1,155.00	1,155.00	1,155.00
2000	0	22	0	0	0	0	0	1,980.00	1,980.00	1,980.00
2001	1	95	0	2	0	1	0	18,868.00	18,868.00	18,868.00
2002	0	33	0	0	0	0	0	2,215.00	2,215.00	2,215.00
2003	Mine	was	not	operating		Mine	was	not	operating	
2004	0	68	0	0	0	0	0	9,575.00	9,575.00	9,575.00
2005	2	181	1	3	13	0	5	130,545.00	130,376.00	30,576.00
2006	6	211	0	2	2	1	1	76,499.00	76,499.00	26,585.00

Sago Mine: Citations / Orders, January 1, 2005 to December 31, 2006

2005

First Quarter (January 1, 2005 to March 31, 2005)

Citations	16
Orders	0
Safe Guards	0
Total	**16**

Second Quarter (April 1, 2005 to June 30, 2005)

Citations	52
Orders	3
Safe Guards	4
Total	**59**

Third Quarter (July 1, 2005 to September 30, 2005)

Citations	70
Orders	12
Safe Guards	1
Total	**83**

Fourth Quarter October 1, 2005 to December 31, 2005)

Citations	47
Orders	3
Safe Guards	0
Total	**50**

Calendar Year 2005

Citations	185
Orders	18
Safe Guards	5
Total	**208**

2006

First Quarter (January 1, 2006 to March 31, 2006)

Citations	122
Orders	2
Safe Guards	0
Total	**124**

Second Quarter (April 1, 2006 to June 30, 2006)

Citations	18
Orders	3
Safe Guards	0
Total	**21**

Third Quarter (July 1, 2006 to September 30, 2006)

Citations	44
Orders	3
Safe Guards	0
Total	**47**

Fourth Quarter (October 1, 2006 to December 31, 2006)

Citations	28
Orders	2
Safe Guards	1
Total	**31**

Calendar Year 2006

Citations	212
Orders	10
Safe Guards	1
Total	**223**

Sago Mine: Citations / Orders by Type, January 1, 2005 to December 31, 2006

2005

First Quarter (January 1, 2005 to March 31, 2005)

104(a) Citation	16
Total	**16**

Second Quarter (April 1, 2005 to June 30, 2005)

104(a) Citation	51
104(b) Citation	1
104(d)(1) Order	3
314(b) [Safe Guard]	4
Total	**59**

Third Quarter (July 1, 2005 to September 30, 2005)

103(k) Order	2
104(a) Citation	70
104(d)(2) Order	10
314(b) [Safe Guard]	1
Total	**83**

Fourth Quarter October 1, 2005 to December 31, 2005)

104(a) Citation	47
104(d)(2) Order	3
Total	**50**

Calendar Year 2005

103(k) Order	2
104(a) Citation	184
104(b) Citation	1
104(d)(1) Order	3
104(d)(2) Order	13
314(b) [Safe Guard]	5
Total	**208**

2006

First Quarter (January 1, 2006 to March 31, 2006)

104(a) Citation	122
104(d)(2) Order	1
107(a) Citation	1
Total	**124**

Second Quarter (April 1, 2006 to June 30, 2006)

103(k) Order	2
104(a) Citation	17
104(d)(1) Order	2
Total	**21**

Third Quarter (July 1, 2006 to September 30, 2006)

103(k) Order	2
104(a) Citation	44
104(d)(2) Order	1
Total	**47**

Fourth Quarter (October 1, 2006 to December 31, 2006)

103(k) Order	2
104(a) Citation	28
314 (b)	1
Total	**31**

Calendar Year 2006

103(k) Order	6
104(a) Citation	211
104(d)(1) Order	2
104(d)(2) Order	2
107(a) Citation	1
314(b)	1
Total	**223**

Sago Mine: Citations / Orders by CFR, January 1, 2005 to December 31, 2006

2005

First Quarter (January 1, 2005 to March 31, 2005)

70.200Series [sampling procedures]	1
75.300 Series [ventilation]	8
75.400 Series [combustible material]	2
75.500 Series [electrical]	1
75.800 Series [under. High-volt]	1
75.1100 Series [fire protection	2
75.1700 Series [Misc.]	1
Total	**16**

Second Quarter (April 1, 2005 to June 30, 2005)

104(b) Citation [unknown]	1
50.200 Series [accident reporting]	1
62.100 Series [noise exposure]	1
70.200 Series [sampling procedures]	2
75.200 Series [roof control]	1
75.300 Series [ventilation]	8
75.400 Series [combustible material]	8
75.500 Series [electrical]	8
75.600 Series [trailing cables]	3
75.800 Series [under. High-volt]	1
75.1100 Series [fire protection	5
74.1400 Series [mantrips / hoisting]	4
75.1700 Series [Misc.]	14
77.200 Series [surface installations]	2
Total	**59**

Third Quarter (July 1, 2005 to September 30, 2005)

103(k) Order	2
70.200 Series [sampling procedures]	1
75.200 Series [roof control]	7
75.300 Series [ventilation]	17
75.400 Series [combustible material]	6
75.500 Series [electrical]	21
75.600 Series [trailing cables]	3
75.900 Series [under low-med-volt]	1
75.1100 Series [fire protection	3
75.1400 Series [mantrips / hoisting	12
75.1700 Series [Misc.]	8
77.400 Series [mech equip]	2
Total	**83**

Fourth Quarter October 1, 2005 to December 31, 2005)

70.200 Series [sampling procedures	1
75.200 Series [roof control]	13
75.300 Series [ventilation]	10
75.400 Series [combustible material]	6
75.500 Series [electrical]	4
75.1100 Series [fire protection	7
75.1400 Series [mantrips / hoisting]	2
75.1700 Series [Misc.]	3
77.100 Series [certified persons]	1
77.200 Series [surface installations]	2
77.400 Series [mech. equip]	1
Total	**50**

Calendar Year 2005

103(k) Order	2
104(b) Citation [unknown]	1
50.20 Series [accident reporting]	1
62.100 Series [noise exposure]	1
70.200 Series [sampling procedures]	5
75.200 Series [roof control]	21
75.300 Series [ventilation]	43
75.400 Series [combustible material]	22
75.500 Series [electrical]	34
75.600 Series [trailing cables]	6
75.800 Series [under. High-volt]	2
75.900 Series [under low-med-volt]	1
75.1100 Series [fire protection]	17
75.1400 Series [mantrips / hoisting]	18
75.1700 Series [Misc.]	26
77.100 Series [certified persons]	1
77.200 Series [surface installations]	4
77.400 Series [mech equip]	3
Total	**208**

2006

First Quarter (January 1, 2006 to March 31, 2006)

103(k) Order	0
107(a) Order	1
104(a) Citation [unknown]	1
75.41.12 [ownership notice]	1
75.300 Series [ventilation]	3
75.400 Series [combustible material]	2
75.500 Series [electrical]	76
75.600 Series [trailing cables]	7
75.700 Series [grounding]	3
75.800 Series [under. High-volt]	2
75.900 Series [under low-med-volt]	10
75.1100 Series [fire protection	3
75.1700 Series [Misc.]	2
77.200 Series [surface installations]	3
77.400 Series [mech equip]	1
77.500 Series [elec. equip.]	6
77.700 Series [grounding]	3
Total	**124**

Second Quarter (April 1, 2006 to June 30, 2006)

103(k) Order	2
50.30 [employment/production reports]	1
70.200 Series [dust sampling procedures]	1
72 600 Series [miscellanious]	1
75.200 Series [roof support]	1
75.300 Series [ventilation]	7
75.400 Series [combustible material]	3
75.500 Series [electrical]	2
75.1100 Series [fire protection	3
Total	**21**

Third Quarter (July 1, 2006 to September 30, 2006)

103(k) Order	2
50.100 Series [notification]	1
75.200 Series [roof support]	9
75.300 Series [ventilation]	22
75.400 Series [combustible material]	2
75.500 Series [electrical]	1
75.1200 Series [maps]	1
75.1400 Series [hoisting/mantrips]	6
75.1700 Series [Misc.]	3
Total	**47**

103(k) Order	2
70.200 Series [dust sampling procedures]	1
72.600 Series [miscellaneous]	1
75.200 [roof support]	5
75.300 Series [ventilation]	7
75.400 Series [combustible material]	4
75.500 Series [electrical]	4
75.1100 Series [fire protection	3
75.1400 Series [hoisting/mantrips	1
75.1700 Series [Misc.]	2
77.200 Series [surface installations]	1
Total	**31**

Calendar Year 2006

103(k) Order	6
107(a) Order	1
104(a) Citation [unknown]	1
50.100 Series [notification]	1
50.30 [employment/production reports]	1
75.41.12 [ownership notice]	1
70.200 Series [dust sampling procedures]	2
72.600 Series [miscellaneous]	1
75.200 Series [roof support]	15
75.300 Series [ventilation]	39
75.400 Series [combustible material]	11
75.500 Series [electrical]	83
75.600 Series [trailing cables]	8
75.700 Series [grounding]	3
75.800 Series [under. High-volt]	2
75.900 Series [under low-med-volt]	10
75.1100 Series [fire protection	9
75.1200 Series [maps]	1
75.1400 Series [hoisting/mantrips]	7
75.1700 Series [Misc.]	7
77.200 Series [surface installations]	4
77.400 Series [mech equip]	1
77.500 Series [elec. equip.]	6
77.700 Series [grounding]	3
Total	**223**

Sago Mine: Citations / Orders, penalties, January 1, 2005 to December 31, 2006

2005

First Quarter (January 1, 2005 to March 31, 2005)

	12	$60.00
	2	$247.00
	1	$324.00
	1	$350.00
Total	**16**	**$1,888.00**
Average Per Citation		**$118.00**

Second Quarter (April 1, 2005 to June 30, 2005)

	5	$0.00
	22	$60.00
	16	$247.00
	3	$268.00
	2	$324.00
	7	$440.00
	1	$878.00
	1	$4,200.00
	1	$5,400.00
	1	$8,200.00
Total	**59**	**$28,382.00**
Average Per Citation		**$481.05**

Third Quarter (July 1, 2005 to September 30, 2005)

	3	$0.00
	38	$60.00
	1	$99.00
	26	$247.00
	5	$268.00
	2	$5,400.00
	4	$6,600.00
	2	$8,200.00
	1	$9,200.00
	1	$9,600.00
Total	**83**	**$80,621.00**
Average Per Citation		**$988.69**

Fourth Quarter October 1, 2005 to December 31, 2005)

	29	$60.00
	4	$247.00
	9	$286.00
	3	$324.00
	1	$440.00
	1	$629.00
	1	$838.00
	1	$4,000.00
	1	$5,600.00
Total	**50**	**$16,781.00**
Average Per Citation		**$335.62**

Calendar Year 2005

	8	$0.00
	101	$60.00
	1	$99.00
	48	$247.00
	17	$268.00
	6	$324.00
	1	$350.00
	8	$440.00
	1	$629.00
	1	$838.00
	1	$878.00
	1	$4,000.00
	1	$4,200.00
	3	$5,400.00
	1	$5,600.00
	4	$6,600.00
	3	$8,200.00
	1	$9,200.00
	1	$9,600.00
Total	**208**	**$127,672.00**
Average Per Citation		**$613.81**

2006

First Quarter (January 1, 2006 to March 31, 2006)

	3	$0.00 or N/A
	80	$60.00
	2	$350.00
	11	$440.00
	3	$614.00
	5	$838.00
	7	$963.00
	8	$1,238.00
	2	$1,576.00
	1	$2,393.00
	1	$5,000.00
	1	$7,500.00
Total	**124**	**$51,062.00**
Average Per Citation		**$411.79**

Second Quarter (April 1, 2006 to June 30, 2006)

	4	$0.00 or N/A
	12	$60.00
	2	$440.00
	1	$963.00
	1	$1,238.00
	1	$1,760.00
Total	**21**	**$5,461.00**
Average Per Citation		**$260.05**

Third Quarter (July 1, 2006 to September 30, 2006)

	3	$0.00 or N/A
	21	$60.00
	1	$247.00
	4	$350.00
	8	$440.00
	3	$614.00
	2	$723.00
	2	$963.00
	2	$1,238.00
	1	$1,576.00
Total	**47**	**$15,693.00**
Average Per Citation		**$333.89**

fourth Quarter (October 1, 2006 to December 31, 2006)

	6	$0.00 or N/A
	17	$60.00
	5	$350.00
	2	$375.00
	0	$614.00
	1	$723.00
Total	**31**	**$4,243.00**
Average Per Citation		**$136.87**

Calendar Year 2006

	16	$0.00 or N/A
	130	$60.00
	1	$247.00
	11	$350.00
	2	$375.00
	21	$440.00
	6	$614.00
	3	$723.00
	5	$838.00
	10	$963.00
	11	$1,238.00
	3	$1,576.00
	1	$1,760.00
	1	$2,393.00
	1	$5,000.00
	1	$7,500.00
Total	**223**	**$76,459.00**
Average Per Citation		**$342.87**