

OWNED AND OPERATED BY
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July 10, 2008

U.S. Environmental Protection Agency
EPA West (Air Docket)
Room 3334
1301 Constitution Avenue, N.W.
Washington, D.C. 2004

JUL 14 2008

Attn: Docket ID No. EPA-HQ-OAR-2008-0260

RE: 73 Federal Register 22901 (April 28, 2008) Proposed Rule 40 CFR Part 60, *Standards of Performance for Coal Preparation Plants*

Dear Sir or Madam:

Western Fuels-Wyoming, Inc. provides the following comments regarding the above proposed rule regarding dust control from coal conveying and crushing facilities. This comment letter is focused solely on the 73 Federal Register 22901 recommendations regarding control of dust during conveyor belt transfers and crushing. We have other concerns with these proposed changes to the Subpart Y regulations, which are addressed by the National Mining Association.

These proposed rules will mandate that non-bituminous coal handling facilities must be vented through a stack and be controlled by use of baghouse dust collectors. We have numerous issues with this proposal, as follows:

Filter Dust Collectors (Baghouses) Pose Unreasonable Fire/Explosion Hazard:

To require baghouses as dust control for combustible dust sources is unnecessary for dust control, impractical compared to alternatives, and will cause significant safety issues at our operation. The EPA may not be aware that subbituminous Powder River Basin (PRB) coal spontaneously combusts if it accumulates for long periods of time, or if it is exposed to water or oxygen. Since baghouses by design extract dust, and eventually suck it to collection point, where it is recycled back onto the belt, baghouses often have dust accumulations which do not purge from the dust collection ductwork. Therefore baghouses are absolutely the WORST possible dust control option for control of dust at a coal or other facility handling combustible dust. The baghouses accumulate dust, moisture eventually enters the ductwork and baghouse proper, and the baghouses spontaneously combust and eventually may EXPLODE!

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In our cover letter of July 1, 2008, we submitted comments from six (6) of our coal handling technicians. They succinctly explained the problems they experience first-hand with baghouses in coal handling operations, and their preference for atomizing fog systems. Their number one issue with baghouses is SAFETY, both the operational safety issues with baghouse explosions/fires, and the increased dust in their working environment when baghouses were used.

We are not the only Wyoming Powder River Basin (PRB) coal mine to have spent an incredible amount of time, money, and energy to get baghouses out of our facility, due to their explosive nature and lack of guarantee of any way to make them immune from fires/explosions. At the Dry Fork Mine, after much investigation, we have implemented a program to replace all baghouses with much safer atomizing fog systems (Fog), and controlled flow transfer chutes (also known as spoon chutes or PECS), combined with primary and secondary enclosures. At our mine, we are in the process of replacing the final baghouse at this time.

As background, I have directed the air environmental program at two coal mines, and a trona mine with sodium carbonate refinery. I have experience with fabric filter baghouses, atomizing fog systems, chemical dust suppression, cyclones, wet scrubbers, electrostatic precipitators, and PECS controlled flow transfer chutes. For some mineral processing operations, baghouses are appropriate. For example, in the trona/sodium carbonate processing industry, baghouses were used without significant safety issues. For some industries (including trona, cement dust, and bentonite), options for control of dust must consider the stickiness of the dust being handled. Baghouses are appropriate at trona and bentonite operations, since wet dust suppression systems would cause caking of the mineral, or contaminate the finished product. However, even within those industries, baghouses are ineffective at controlling indoor, working area dust, the baghouses have significant O&M problems, and the baghouses are inherently more dangerous than atomizing fog suppression systems or PECS. But if you can't use water for dust control, there are few options.

However, at coal processing plant facilities, including bituminous, subbituminous and lignite, coal dust is a combustible dust. This causes the baghouses and their collection ductwork at coal mines to periodically catch fire and sometime explode. The three former baghouses at the Western Fuels Dry Fork Mine have been on fire several times each, two involving explosions. One of the explosions caused a silo to catch fire inside. We were lucky we did not have the silo explode and cause serious injury and property damage. The other baghouse explosion ignited a grassfire 500 feet away. If that had occurred at night, it could easily have gotten out of control and ended up damaging other facilities or causing offsite damage. These fires occurred even though we took extraordinary O&M measures on the baghouses to try to prevent fires.

- We washed accumulated coal fines out of the ductwork, to reduce coal fine accumulations in the pickup hoods and ducts. This was intended to reduce the risk of spontaneous combustion of the accumulated coal dust.
- We rebalanced all the hoods and ductwork.
- We installed more ductwork openings for better cleaning and inspection.

- Before letting employees open a baghouse inspection door, they checked temperature of the baghouses and took CO readings. These were necessary to reduce the risk of employees being caught up in a smoldering fire and then opening a door, adding oxygen, and turning the smoldering fire into an explosion.
- We cleaned out the baghouse hopper before each shift, again to minimize dust accumulations and reduce bridging in the baghouse hoppers.
- All baghouses were equipped with methane sensing fire suppression systems, which were maintained more vigorously.
- We inspected and changed bags often.
- We repaired and resealed the baghouse explosion doors and cages after each explosion.
- We heated the baghouse bin hoppers to keep collected coal dust material flowing properly in winter.

All these efforts to reduce the risk of baghouse fires did not alleviate the problem. We would still find instances of smoldering coal in the baghouses. Even with an aggressive baghouse O&M program, we were also not meeting MSHA indoor dust exposure compliance requirements within the coal handling buildings, so obviously a change was necessary. This led us to the path of exploring other dust control options for our facility.

Filter Dust Collectors (Baghouses) do a poor job of reducing employee dust exposures:

The baghouses at the Dry Fork Mine were sized for eventual doubling of our production throughput and more silos. Even with these oversized baghouses, we could not consistently achieve the MSHA required indoor dust exposure standard of 2 mg/m³. Baghouse technology simply did not satisfactorily control the dust inside the buildings. The reason baghouses do not work to clear up indoor air quality is because when baghouse bags purge, they dump the dust back onto a belt or silo, causing a huge WOMP of dust to fly throughout the plant. Some of the dust goes onto the belt, but a large amount flies all over the plant and ends up on the floors, on the baghouse ductwork, on conveyor hoods, piping conduits, etc. The best analogy I have heard about baghouse technology is that it is the equivalent of vacuuming your home for an hour and then emptying the vacuum cleaner canister onto your living room floor. Makes absolutely no sense, does it? But that is what baghouses do, and that is why baghouses are so poor at controlling inside dust. This was also a problem at the sodium carbonate refinery I previously worked at. However, the sodium carbonate dust was not a combustible dust, therefore accumulations did not result in as many safety compliance implications.

In contrast to sodium carbonate dust, if coal dust is not cleaned up promptly, it can spontaneously combust. Cleanup after baghouses dump on belts involves using large amounts of washdown water to wash the dust out of the plant. That means we have lots of dirty water that must be treated and discharged. This constant washdown due to poor dust control technology was an incredible waste of a water resource, and is also a source

of MSHA compliance problems. In the winter the constant washing down causes floors to ice over and causes employee slipping and falling incidents.

Even the baghouse pickup hoods and ducting has been problematic. The inside dust cakes on these hoods and ducts, and can spontaneously combust. At Dry Fork, after we switched to Fog systems, we were able to remove the unnecessary baghouse hoods and ducting. This reduced our washdown water usage while eliminating this safety concern.

Filter Dust Collectors (Baghouses) episodically cause large purges of uncontrolled dust to enter the environment:

Baghouses do a very poor job of “controlling” dust. Those WOMP’s of bag dust described above sometimes would billow out the explosion vents in our plant. Doing maintenance on baghouses also results in more uncontrolled releases of dust directly from the baghouse into the environment. Once again, envision the household vacuum cleaner. Changing bags in a filter dust collector is no different than changing a bag on a vacuum cleaner. Just imagine all the dust that is released into your home when you change a bag on a vacuum cleaner. Now multiply that by the size of these industrial baghouses. And we have no choice but to let that dust just float into the air. Bag replacement also needlessly exposes the maintenance personnel to very fine coal dust, plus needlessly emits large volumes of dust to the environment. Finally, bags do freeze up and break. When they break, all that vacuumed up dust just billows into the air, completely uncontrolled. And, while the problem bag is being found and replaced, the operator is often forced to operate without any dust control system in place. Where is the common sense in all this? In contrast to baghouses, Fog systems and PECs work all the time.

Baghouse Fire/Explosion Documentation

Our main concern with baghouses is safety. Potentially explosive dust is a serious problem for the coal industry, which SIMPLY CANNOT BE IGNORED as you write regulations. The safety concern is not just limited to our mine. Attachment 1 contains a printout of Wyoming coal mine baghouse related accidents since 2004, that were severe enough to require reporting to MSHA. Minor incidents are not included in this printout. Please remember that even one is too many, due to the potential for extreme injury and property damage. One recent baghouse explosion in the PRB nearly killed an employee. That employees lungs are so badly burned he must sleep with oxygen the rest of his life, and his daytime quality of life is severely impaired. Every PRB mine has its horror stories. That is why nearly all the mines in the PRB are or have switched from baghouse dust control to newly developed Fog and PECS systems for dust control.

Attachment 2 is an evaluation of the U.S. Chemical Safety Board Investigation of Combustible Dust Incidents from 1980 through 2004. A simple assessment of the data from the U.S. Chemical Safety Board shows that eighteen (18) percent of all incidents and eighteen (18) percent of all fatalities at combustible dust handling facilities involved dust collection devices. Nineteen percent of all incidents involving injuries involved dust

collection equipment. **THAT IS 21 DEATHS, AND 134 INJURIES TOO MANY.** Clearly, this in depth evaluation by the U.S. Chemical Safety Board justifies rethinking of how we handle dust in the United States. Dust collection is clearly **NOT a safe method of dust control in a combustible dust environment.** Based on this evaluation, the U.S. EPA should be advocating replacement of dust collection devices, where possible and practical. Instead, in these proposed regulations, the U.S. EPA is advocating the use of vents and ducting to a baghouse dust collector wherever possible. We cannot overly emphasize how wrong this approach is!

Baghouses have many other Environmental and Employee Exposure Concerns:

We have many other reasons for urging you to ban baghouses from combustible coal dust handling facilities. Our former baghouses used 2.5 times as much energy as our Fog systems, are extremely noisy, and are dangerous to maintain. The MSHA noise standards would have been very difficult to meet if we still had baghouses. Keeping baghouses and their associated ductwork and bins clean enough to safely operate consumes huge amounts of plant washdown water. As our plant technicians have attested in their letters sent July 1, 2008, since switching to Fog, our plant is now cleaner overall, which reduces plant washdown water use at our mine. We can't emphasize enough just how much better Fog systems have been for us. They use less water than baghouses, are cleaner inside the building and outside the building, and are safer.

Baghouses promote dust. Fog Systems are dust prevention technologies.

Explanation of PECs and Fog Dust Control Technologies:

The technology for agglomerative fog systems and PECs (Passive Emission Control Systems) are much more environmentally friendly because they prevent the dust from escaping the process in the first place. PECs prevents dust from escaping the transfer chutes by gently "sliding" the coal from one belt to another. PECs chutes (also known as "Controlled Flow Transfer Chutes") are fully enclosed, and this chute and enclosure are secondarily contained inside a building. This combination of gentle slide chute plus primary and secondary dust enclosures is a vast improvement over the old design of "dumping" from one belt to another. By this new system, the inherent dust in the coal material is not allowed to be entrained.

In some areas, there is not sufficient space to allow PECs chutes to be installed. Fog technology has proved just as effective in control for those transfers. In fog technology, the fog (a sonic induced mixture of 10-15% water and 85-90% air) is sprayed over the belt, both before and after the transfer points. In this system, the conveyor belt transfer points are also completely enclosed, to allow retention time for the fog to work. A transfer building provides secondary enclosure around the entire process. Within the transfer point, the particles in the fog (not a spray, not a mist) are so tiny in size that they attract the dust in the transfer hoods, allowing the dust to agglomerate to the water fog

particles. These heavier dust and fog mixed particles then settle back onto the belt within the primary or secondary enclosure areas. The fog treated dust then moves along to the next transfer (which is also primarily and secondarily enclosed, and is treated with fog), into the silos (which are also fogged), and eventually into the coal cars where it is sold as product. This fog/enclosure process, like the PECs process, prevents the dust from escaping into the environment. We also have very high success using this method of fog combined with double enclosures to treat crushing operations.

In summary, both fog systems and PECs systems have proven to be far superior to baghouses for dust control both within the working environment (for MSHA compliance) and outside the buildings (for EPA and Wyoming Dept of Environmental Quality compliance).

Baghouses are also more expensive than Atomizing Fog:

Attachment 3 to this letter contains an analysis of costs for dust control from a typical PRB coal mine operating at up to 15 mtpy. Four technologies were evaluated, including atomizing Fog, PECs, extracting and wet scrubbing, upgrading existing baghouses, and installing new baghouses designed to meet the proposed standard. Capital costs to repair and upgrade existing baghouses or replace them with fog systems were similar. However, long term fog operational costs are much less for fog than the cost to operate the baghouses. The reason is primarily that the baghouses in the PRB typically burn up at a rate that requires constant rebagging and major rebuilds. Table 1 in Attachment 3 shows that when the baghouses were upgraded to the proposed EPA standards, the capital cost is the highest of all options. When those higher cost replacement baghouses are combined with the higher operational and maintenance costs of baghouses (versus fog), Table 1 shows that baghouse dust control would cost about 4 times as much as our current fog dust control over a 30 year estimated life. This is significantly more cost with no demonstrated benefit. In fact, we contend the environmental impacts are worsened by use of baghouses instead of fog systems.

These estimates do not take into consideration any production down time that regulators (MSHA, EPA or Wyoming Department of Environmental Quality) may impose if production were required to cease while baghouses were taken down for O&M. It also does not include the higher cost of compliance for MSHA down time due to poor indoor dust control. The baghouses do not solve that problem. In fact, the baghouses will only exacerbate the problem with indoor dust.

Clearly, Attachment 3 demonstrates that baghouses are the most expensive option for control of dust at our facility. But expense was not the reason we decided at our operation to change to Atomizing Fog systems. Safety and environmental improvement were the primary drivers of our quest for change. Our experience since converting our plant is that the Fog systems have been MUCH more successful at controlling both indoor dust (MSHA regulated) and outdoor (EPA regulated) dust.

Cost/Benefit of Fog/PECs versus Baghouses:

Using the cost information developed in Attachment 3, the cost/benefit of fog systems can be compared with baghouse controls at a typical PRB Coal Mine. For this study, four permitted baghouses at this example mine were permitted for a total of 31.0 tons/yr of particulate. The four replacement fog and PECs systems were re-permitted for 0.0 tons/year of particulate (Wyoming Department of Environmental Quality/ Air Quality Division current permit standard for PECs and atomizing fog systems). In a cost/benefit ratio, the cost to control one ton/year of dust by the various methods is shown in Table 3 of Attachment 3. As shown in Table 3, the costs range from \$14/ton/year for fog control, to \$57/ton/yr for the upgraded baghouses being contemplated by the EPA.

Table 3 in Attachment 3 demonstrates the higher cost of baghouses compared to Fog and PECs systems for control of dust from coal handling transfer points. However, this information is misleading, as it does not include the cost to control indoor dust, completely resolve baghouse fire/explosion hazards, and noise pollution caused by the baghouses. It also excludes the cost for vacuum trucks used for cleanup of coal dust collected in baghouses. Solutions to those issues have not yet been found, so the total cost to operate baghouses in combustible dust environments continues to be unknown.

Documentation that Atomizing Fog is Effective at Controlling Dust:

In my conversation of May 14, 2008 with Mr. Christian Fellner, U.S. EPA, I was asked for documentation of systems that work better than baghouses at controlling dust. We have such documentation, which I agreed to provide to Mr. Fellner. In Wyoming, prior to approving changing from baghouses to Fog or PECS systems, the WDEQ, AQD extensively investigated the Fog systems and only agreed to implement the requested change if operators would agree to provide additional monitoring and maintenance for the systems. The WDEQ, AQD required all companies to inspect the Fog systems on a schedule varied by mine production levels (more inspections at higher producing operations). For more than a year, Dry Fork Mine plant personnel have been taking visual dust readings of the fogged areas each shift. For at least the past year, we have had no instances of visible dust since switching most of our plant to Fog systems. Those records are available at the mine, (electronically and paper). The AQD views those records during inspections. A copy of a typical daily shift report for the Plant is included in Attachment 4 to this report.

My verbal discussions with plant operators confirmed my observations over the years. All the plant technicians at our mine agree that the dust escaping from our coal processing plant is much less than had been present when we operated with baghouses. They are much happier with the indoor air quality, as well. The Fog and PECs systems just do a better job overall. In summary, baghouses are only clean coming out of the stacks. But they don't do a very good job overall in controlling dust in coal processing plants.

Based on the feedback from our plant technicians, we contend that the transfer points treated with fog systems have virtually no emissions. WDEQ allows these to be permitted with 0 lb/hr from areas treated with Fog or Pecs, based on the WDEQ's visual observations. Hence, our Fog system is far superior to the 31.0 tpy of dust permitted with the former four baghouses operating at the Dry Fork Mine.

Maintenance Records also Document Fog System Utilization:

The Subpart Y proposal asked whether there were measures that regulatory agencies take to ensure the dust control technologies are appropriately operated and maintained. In Wyoming, the AQD requires O&M records be retained for the Fog systems, and that they be maintained on a scheduled frequency that is dependent upon production throughput. For our operation, we have monthly O&M records of the maintenance performed on each Fog system area. Our plant technicians record the air and water pressure of the system each month, which documents that the system is performing properly. Also, the operators are required to look at each transfer building during each shift when coal is being handled. If a dust problem is seen, they are to investigate and solve the problem immediately (ie, repair the dust control system). Presently, we think the documentation of the air and water pressure readings during monthly O&M checks combined with daily visible emission assessments is adequate to show that the Fog systems have been operating as designed. Again, the Wyoming Department of Environmental Quality reviews these records during inspections, and has found no issues with them at our operation. A copy of a typical monthly O&M report for the foggers is included in Attachment 4.

We do not have similar information available for baghouse dust collectors. Since we are not a Title V operation, we have not had to provide detailed O&M information about baghouses. We have performed stack tests as required by our permit.

Atomizing Fog Technology is Compatible with Opacity Measurement and Documentation:

One of the items requested by Mr. Christian Fellner, U.S. EPA was a determination of opacity from Fog dust control systems. He said that they did not have any information and could not approve the use of Fog technology without more information. We have operations personnel looking at the transfer points twice daily (when operating). They have never seen dust escape since we switched to Fog systems. This information is maintained at the mine and is available during inspections.

We would like to caution the agency regarding their method of setting opacity standards. We are aware that some regulatory agency personnel never give a zero opacity from a source which may emit dust, but instead always automatically give any potential dust source at least a 5% opacity reading. Therefore we are very uncomfortable with any

standard that is set at 5% (the EPA's proposed limit). At our operation, we have demonstrated that we can easily meet the current 20% opacity standard using Fog technology. However, we are concerned that the EPA is proposing baghouses as Best Demonstrated Technology (BDT). If we switch back to baghouses, our transfer buildings, crusher buildings and silos will again occasionally emit up to 20% opacity as it had when we formerly utilized baghouse treatment technology. Those areas are better now, thanks to the Fog technology and can easily meet the current 20% opacity standard. Because the EPA is considering baghouses as BDT, we oppose any lessening of this standard.

We think a weekly Method 22 and a quarterly Method 9 average opacity standard for documenting control of dust using baghouses, Fog or PECs for coal crushing, conveying, and transferring facilities is appropriate and adequately demonstrates compliance. This would generate the information the Agency could use in future evaluations of this standard.

Also, silos should be exempt from any opacity standard less than 20%. Since silos are such a monumental improvement over open stockpile dumping, they should not be overly restricted for opacity. Most of the time our silos can meet 7% opacity when coupled with fog dust control systems. However, in the past I noticed that the silos occasionally barely complied with the 20% opacity limit when we had utilized baghouses for dust control.

Concerned that US EPA is overly focused on the "stack" and not with the overall system:

We have a real concern that the proposed regulations are not comparing apples to apples when it comes to comparing dust control systems. The dust control effectiveness of baghouses is only determined by looking at opacity coming out of the stack, and by occasional stack testing. However, dust control of fog systems and PECs systems is determined at the source, where the dust is generated. If the entire baghouse and its pickup ductwork, the source, as well as the baghouse purge system were read by Method 9, (instead of just the baghouse stack), most baghouses would not be able to meet the proposed 5% opacity. If baghouses were read while bags are being changed, and while bins are being manually emptied, they wouldn't even meet a 20% opacity limit. Also, with baghouses, plant personnel have to frequently bang on the ductwork to make the dust MOVE, so that it doesn't accumulate and eventually spontaneously combust. If baghouse stacks were read while the ductwork was being cleaned, the baghouse would not meet the opacity standard. Baghouses are difficult to operate in a steady condition due to constantly changing weather conditions, and feedstock conditions. Also, the standard does not include support equipment to maintain and clean the baghouses (such as vacuum trucks). After working with all these different dust control systems, PECs and Fog systems are far superior to baghouse treatment systems at controlling dust from coal handling sources.

Summary of Differences between Baghouses and Fog/PECS:

Fog and PECs work all the time. Baghouses are only clean coming out of the stack, when no maintenance is occurring and when no bags are broken. Fog and PECs are clean everywhere, all the time. Baghouses do not effectively control inside dust due to baghouse ineffectiveness and difficulty to maintain, to balance, to keep ducts clean, and to keep bins from plugging. Periodic stack testing only shows the effectiveness of the emissions coming out of the stack. Stack testing does not show the effectiveness of the overall dust control system. Fabric filter dust collection is usually ineffective at controlling dust in a consistent basis. In our opinion, baghouses should not be the preferred dust control for any industry except those whose material cannot get wet and those whose material is non-combustive.

Baghouse Safety Liability is Too High:

Baghouses at coal handling facilities are a threat to anyone who walks through the facility or is anywhere near. If we operate baghouses, it is nearly impossible to comply with MSHA safety standards due to their potential for fires/explosions. Baghouses also have been proven to be much less effective at control of inside dust, also leading to concerns with MSHA dust safety standards. Fog systems have eliminated both these safety issues at our operation, while also meeting EPA emission standards.

Issues with Other Portions of Proposed 73 Fed. Reg. 22901

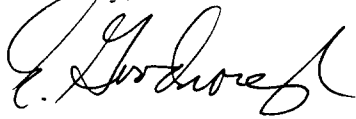
This letter is solely focused on the baghouses versus other dust control technologies, and solely focuses on conveyor transfer points and crushing facilities. This letter does not address coal truck dump hoppers, or the basis for these regulations. We have numerous other issues with the proposed standards at 73 Fed. Reg. 22901, and support the National Mining Association position that these proposed regulations are confusing, the basis for the regulations is significantly flawed and the entire proposed regulation should be reevaluated in its entirety.

I have worked with the Subpart OOO regulations when I worked in the trona mining/sodium carbonate refining industry. I encourage the EPA to mimic the language in those standards for Subpart Y. The Subpart OOO standards are much more straightforward, easier to understand, and easier for operational staff to determine compliance status.

Summary and Recommendation:

Our safety and environmental concerns with baghouse dust collectors are serious and deserve your attention and consideration. We are available should you have any questions regarding this comment letter at (307) 686-8841.

Sincerely,

A handwritten signature in black ink, appearing to read "Beth Goodnough", written in a cursive style.

Beth Goodnough
Director of Regulatory Affairs

Attachment 1

MSHA Accident Reports involving Baghouse Dust Collectors in the Powder River Basin
2004 – 2008 YTD



U.S. Department of Labor
Mine Safety and Health Administration
 Protecting Miners' Safety and Health Since 1978

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MSHA Data Retrieval System - Mine Accidents



As Developed by PEIR

Mine Accidents

Current Mine Information

Mine ID: 4801215
Operator: Thunder Basin Coal Company LLC
Opr. Begin Date: 11/1/2000
Mine Name: Coal Creek Mine
Current Controller: Arch Coal Inc
Mine Status: Active
Status Date: 12/23/2005
Mined Material: Coal (Bituminous)
Type of Mine: Surface
Location: Campbell County, WY
State: WY

Operator History for Mine ID: 4801215

Operator Name	Begin Date	End Date
Thunder Basin Coal Company LLC	11/1/2000	
Washington Group International Inc	9/1/1999	10/31/2000
Fuller Construction Inc	1/1/1997	8/31/1999
S & M Construction Inc	4/18/1994	12/31/1996
Thunder Basin Coal Company Llc	1/1/1979	4/17/1994

How do I use this information? [Click Here](#)

Please note that the information provided by the Data Retrieval System is based on data gathered from various MSHA systems. As there may be a lag time in data being entered into those systems, there will also be a lag in the reflection of that data on the DRS

Please Note:

If there is a Contractor ID listed, this indicates that the accident involved a contractor employee.

You may click on the Submit button to view further information about the contractor.

Accidents and Injuries

Mine ID: 4801215 Current Operator: Thunder Basin Coal Company LLC

Please Note: Thunder Basin Coal Company LLC has been the current operator since 11/1/2000

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	4/6/2008	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0

Water truck driver saw smoke and flames in the area of the primary crusher. When the smoke and dust cleared, an explosion door was found to be off the #2 dust collector

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	9/1/2006	Days Restricted Activity Only	Slip or fall of person	Coal-m/nm sampler/dust sampler/lab tech Walking/running	.32	.32	.32

The technician fell down while walking along the #1 conveyor causing an avulsion fracture to the top of the left shoulder.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
ZDK	8/5/2006	No Days Away From Work, No Restrictive Action	Handling of materials	Shopman/millwright/machinist/bit sharpnr Operate surface equipment, nec	11.00	.07	9.00

Employee was operating vertical metal boring equipment. Employee was brushing metal cuttings away with gloved hand. Cuttings cut glove and hand. Finger required 12 stitches.

	12/4/2005	No Days Away From Work, No Restrictive Action	Machinery	Welder/blacksmith Grinding bits/steel/welds	.57	.57	13.00
EMPLOYEE WAS USING AN AIR POWERED DIE GRINDER TO GRIND OUT A RACK IN A TORQUE TUBE. THE BIT PIERCED THE INNER WALL OF THE TUBE CAUSING BACK PRESSURE. THE PRESSURE BLEW THE DEBRIS UP UNDER THE EE'S HOOD & SOME METAL WENT INTO HIS LEFT EYE.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	11/16/2005	No Days Away From Work, No Restrictive Action	Handling of materials	Laborer/utility man/bull gang Machine maintenance/repair	16.36	16.36	16.36
A plant employee was assisting with a drive belt change out in the west (old) crusher. While attempting to pull the belt on, his left index finger was pinched between the belt and the sheave resulting in the tip of his finger being cut off.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
XLQ 	11/14/2005	Days Away from Work Only	Powered haulage	Truck driver Operate haulage truck	.86	.86	.86
DUMPING A LOAD, THE CAB WENT UP IN THE AIR WHEN THE LOAD WAS DUMPED, THE CAB THEN CAME DOWN HARD & JARRED HIS BACK.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
VM3 	10/20/2005	Days Away From Work & Restricted Activity	Handtools (nonpowered)	Mechanic/repairman/helper Hand tools (not powered)	.17	.17	.17
At the time of the incident EE was making repairs to an air compressor on a CAT 793 off-highway truck. As he was pulling on a wrench, to loosen an air line going to the compressor, he experienced pain in his upper left arm.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
K9Y 	10/12/2005	Days Restricted Activity Only	Slip or fall of person	Mechanic/repairman/helper Get on/off equipment/machines	3.00	3.00	3.00
Stepping down off ladder from a drill he sprained his ankle.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	10/8/2005	Days Restricted Activity Only	Handling of materials	Sizing/washing/cleaning plant opr/worker Machine maintenance/repair	34.46	1.46	1.46
Employee, working in the plant, was assisting with replacement of return idlers in the west tube. The return idler slipped and struck the employee on the left ankle and knocked him down. The employee suffered a fractured ankle and broken rib.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	9/15/2005	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0
At the east grizzly heat was generated from warm coal in old duct work left from a de-commissioned bag house. To allow water to drain, a 6?? hole was cut into a cover plate where a pipe was once connected to the baghouse. As the water began to flow from the hole, dust was carried with the water and flashed. The flash occurred outside of the facility.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
NFU	9/10/2005	Days Away From Work & Restricted Activity	Handling of materials	Truck driver	20.00	7.00	20.00

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	11/20/2005	No Days Away From Work, No Restrictive Action	Striking or bumping	Bulldozer/tractor oper. Get on/off equipment/machines	1.92	1.92	.07
The employee was crossing in front of the cab of an Komatsu 830-E haul truck and struck his left leg against a piece of metal under the windshield causing a cut that required five sutures to close.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	11/4/2005	Days Away From Work & Restricted Activity	Handling of materials	Mechanic/repairman/helper Machine maintenance/repair	5.36	5.36	.94
The employee was removing an inspection plate of a D-11 dozer to change transmission fluid. The plate would not come off so the employee was going to get a pry bar. He placed his hand on the floor to scoot out from under the machine when the plate fell from the dozer onto his right hand.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	10/3/2005	No Days Away From Work, No Restrictive Action	Handtools (nonpowered)	Oiler/greaser Hand tools (not powered)	10.38	10.38	.13
The employee was loosening a bolt using a hammer wrench when the wrench slipped and caught his left ring finger between the wrench and the motor casing. The wound required stitches.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	8/16/2005	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0
The NEMA baghouse had an unplanned ignition resulting from smoldering coal being sucked into the baghouse as the baghouse fan was turned on after a pro-longed outage. The ignition resulted in one of the explosion doors being blown open. The system was shut down, MSHA was notified and the hot spot was eliminated by the use of water.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
E244	6/24/2005	Accident Only	Electrical	Not Applicable Not Applicable	0	0	0
Water truck parked at end of shift. During am hours, short occurred at battery cable. spark ignited grease on frame grease dripped onto fuel line, melting small hole in line. Diesel dripped onto ground. Sparks ignited diesel on ground. Passing coal train saw smoke underneath truck @ 5:30 am called wright fire dept. fire dept arrived @ 6 am. extinguished fire @ 6:03 am.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	12/15/2004	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0
Grease and coal dust around a bearing located on a McLanahan crusher caught fire which ignited suspended coal dust. This resulted in hot embers being drawn into the dust collector system causing an ignition of coal dust and a fire in a bag house.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	12/2/2004	Days Away from Work Only	Slip or fall of person	Truck driver Walking/running	1.00	.03	1.00
The employee sustained an injury to his right knee due as a result of slipping on a snow covered surface. The employee was walking from the administration building to the shop ready line.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
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Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
J2H	5/25/2004	No Days Away From Work, No Restrictive Action	Machinery	Drill operator (coal/wagon/diamond) Operate surface equipment, nec	.05	.05	.05
Drill crew was air developing a previously drilled and cased 5" hole. Approx 160' of 1" t & c steel line was suspended in the slips on the rig table. The slotted wrench tipped allowing 1" line to fall about 1 1/2 ft to the table. The 2" elbow adaptor caught ee's finger between table and adaptor requiring stitches.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	5/19/2004	Days Away From Work & Restricted Activity	Powered haulage	Truck driver Travel - to/from work location	2.00	1.38	1.38
PIT BUS #2281 WAS DRIVING EMPLOYEES TO THEIR RESPECTIVE VEHICLES PARKED IN THE PIT. THE BUS DRIVER HIT A DIP IN THE ROAD & THE EE IN THE BACK SEAT SUSTAINED A SOFT TISSUE LOWER BACK INJURY.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	4/25/2004	Days Away From Work & Restricted Activity	Handling of materials	Bulldozer/tractor oper. Machine maintenance/repair	24.92	24.92	5.50
Pulling parting 70 bls chunk preparing to replace a 2300 p&h shovel track pad felt pain in right shoulder. continuing to work and perform all functions of job. 7/2/4 asked to see orthopedic surgeon. prescribed steroids and physical therapy to enhance healing of rotator cuff ligaments.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	3/20/2004	Days Restricted Activity Only	Machinery	Truck driver Operate haulage truck	2.00	.55	.55
A #2067 haul truck was backing under the 1214 shovel when the door to the bucket opened accidentally. The operator was jostled in the cab of the haul truck causing soft tissue injuries to his lower back. The physician prescribed 3 days of restricted duty activity. He returned to work with a full duty release on his next scheduled shift.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	3/6/2004	No Days Away From Work, No Restrictive Action	Other	Shotfirer/blaster/shooter/helper Handling explosives	8.50	8.50	2.23
EE WAS PUTTING DELAYS OUT ON THE BLASTING PATTERN, WHEN A GUST OF WIND BLEW BLASTING AGENT INTO HIS RIGHT EYE. HE WAS WEARING SAFETY GLASSES AT THE TIME OF THE INCIDENT. HE WAS TAKEN TO THE HOSPITAL WHERE THEY IRRIGATED THE EYE AND GAVE HIM ANTIBIOTIC MEDICATION. HE WAS RELEASED TO FULL DUTY.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	2/16/2004	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0
AT 4:00 AM EE ATTEMPTED TO UNPLUG THE #34 FEEDER BY BLASTING IT. A PLANT OPERATOR FAILED TO TURN OFF THE BAGHOUSE FAN. AT APPROXIMATELY 4:50 AM AN EE NOTICED SMOKE AT THE BAGHOUSE. THE MERT TEAM WAS NOTIFIED & THE FLAMES PUT OUT APPROXIMATELY 15-20 MINUTES LATER. THE PLANT & MERT TEAM HELPED WASH OUT AMBERS FROM THE DUCT WORK. THE PREP PLANT STARTED OPERATING AT 1:00 PM.							

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ID	Date	Injury		Activity	Exper.	Exper.	Exper.
	7/13/2004	Accident Only	Electrical	Not Applicable Not Applicable	0	0	0
Suspect that lightning struck during a severe thunder storm causing ignition of coal dust inside the dust collection baghouse atop silo 3. A computer time stamp of 6:53 p.m. indicated miscellaneous and unconnected electrical disruptions. Baghouse doors found open and bags gone at 12 noon on 07/14/04. Investigation began into how, what and when.							

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infection) as a result of the un-treated burn.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	7/28/2007	Days Restricted Activity Only	Stepping or kneeling on object	Coal-m/nm sampler/dust sampler/lab tech Hand load; hand shoveling/mucking	.38	.38	.38
Employee slipped on wet coal at the Loadout facility and sprained right ankle. Received X-ray and air cast at the hospital and is working light duty.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	5/23/2007	Days Restricted Activity Only	Handling of materials	Laborer/utility man/bull gang Handling supplies/materials	1.21	1.21	1.21
Employee bent over to pull water wash hose and pulled a muscle in his back.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	5/18/2007	Days Restricted Activity Only	Machinery	Welder/blacksmith Welding and cutting elect/acetyl	1.69	1.69	1.69
Employee was cutting with a torch, when he felt his leg getting warm. Hot slag had come in contact with his lower coverall pant leg and started to burn. He smothered the smoldering cloth and received a burn on his skin on a 4 inch by 4 inch area. He took steps to keep the skin clean and was transported to the hospital for treatment.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	4/27/2007	Days Restricted Activity Only	Powered haulage	Mechanic/repairman/helper Operate surface equipment, nec	6.71	6.71	6.71
Employee was working in the man basket of a bucket truck. The basket dropped 2-3 feet while employee was leaning against top of basket causing injury to his rib and chest area.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	1/4/2006	No Days Away From Work, No Restrictive Action	Machinery	Mechanic/repairman/helper Welding and cutting elect/acetyl	.48	.48	5.23
Employee was arc welding. Raised his welding hood to chip at some slag. A piece of hot slag came over the top of his safety glasses and lodged in the corner of his right eye. Treated and released back to work by a local optometrist.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
8WY	12/19/2005	Days Away from Work Only	Handling of materials	Bulldozer/tractor oper. Machine maintenance/repair	2.00	.01	2.00
Operator assisting mechanic to drive ripper shank out of socket on tool bar. Metal shard struck left inner thigh becoming imbedded in flesh. Cold morning - about 10 degrees.							

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	7/18/2005	Accident Only	Ignition or explosion of gas or dust	Not Applicable Not Applicable	0	0	0
One of our dust collectors empties into a trailer mounted bin that is then towed to the waste dump for disposal. As an employee open a slide gate and coal dust began spilling out, the dust ignited. Trailer and towing vehicle sustained paint damage.							

Contractor	Accident	Degree of	Classification	Occupation	Total	Mine	Job
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when we had an ignition. This employee did sprain his left knee but it did not hurt until 10/04/07. Employee is a control room operator seat # 2 and is performing that duty full time No LTA.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	10/1/2007	No Days Away From Work, No Restrictive Action	Ignition or explosion of gas or dust	Mechanic/repairman/helper Inspect equipment	5.23	.23	5.00

This accident was reported to MSHA. This employee is an additional injury that just showed up. Employee was standing with 2 other employees when we had an ignition. Employee got dust in his eyes from the blast. Employee is a control room operator seat # 2 and is performing that duty full time No LTA.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	9/4/2007	No Days Away From Work, No Restrictive Action	Slip or fall of person	Mechanic/repairman/helper Walking/running	5.00	.21	5.00

Mechanic was walking across the plant towards the maintenance shop, when the plant suffered a power bump. At that time all ground lights as well as the maintenance shop went out. The mechanic tripped over a black skid steer bucket, which was laying on the ground. When landed his left knee landed on a rock, bruising his knee. He did not miss any work.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	8/17/2007	Days Away from Work Only	Slip or fall of person	Mechanic/repairman/helper Get on/off equipment/machines	12.00	2.19	2.19

Exiting fork lift. Snagged cuff of overalls on window latch and twisted left shoulder.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	8/9/2007	Days Away from Work Only	Stepping or kneeling on object	Sizing/washing/cleaning plant opr/worker Handling supplies/materials	1.38	1.38	1.38

While cleaning the top of silo #2, employee stepped on a 3" bolt that was sticking out of the concrete. Employee twisted left knee.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
XLQ 	7/6/2007	Days Away from Work Only	Fire	Laborer/utility man/bull gang Inspect equipment	1.00	1.00	1.00

Received burns from fireball caused by spontaneous combustion in the dust collector.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
	3/21/2007	No Days Away From Work, No Restrictive Action	Machinery	Mechanic/repairman/helper Machine maintenance/repair	1.50	1.50	1.50

Employee performing maintenance on a calcium carbonate pump system opened a ball valve and some of the liquid splashed against a wall and into his left eye.

Contractor ID	Accident Date	Degree of Injury	Classification	Occupation Activity	Total Exper.	Mine Exper.	Job Exper.
K432 	10/11/2006	Days Away From Work & Restricted Activity	Slip or fall of person	Coal-m/nm sampler/dust sampler/lab tech Walking/running	16.00	10.00	7.00

When employee walked across the lab to help set samples in ADL, she slipped on wet spot caused by employees tracking snow in on their feet. She tried to catch herself, twisted her right knee. Since she couldn't bear weight on right foot, she went to emergency room. She returned 10/12/06 & continued normal work schedule & duties until surgery on 11/13/06. Reportable as LTA 11/13/06.

Attachment 2

U.S. Chemical Safety Board Investigation of Combustible Dust Accidents
1980 - 2004

Attachment 2
U.S. Chemical Safety and Hazard Investigation Board, Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
1	1980	1/24/1980	IN	0	0	Food		Starch Plant				
2	1980	2/1/1980	MN	1	8	Food	Bin/conveyor	Powdered milk mill				
3	1980	2/8/1980	IL	0	0	Food		Wet Corn Milling	Unknown			
4	1980	5/9/1980	OK	0	2	Food		Dehydration Plant				
5	1980	5/10/1980	NC	0	0	Food		Unknown				
6	1980	7/22/1980	FL	0	0	Food		Brewery				
7	1982	1/1/1982	NE	0	0	Inorganic						
8	1982	5/6/1982	MN	0	9	Plastic	Electric motor	Industrial Organic Chemicals	Spark			
9	1982	10/18/1982	IA	0	0	Food		Starch Plant	Smoldering Material			
10	1983	4/19/1983	WI	0	9	Wood	hopper, cyclone system, dust collection system	furniture manufacturer		1		9
11	1983	5/1/1983	NC	0	0	Wood	Air handling unit	furniture manufacturer	Flame			
12	1984	2/20/1984	KY	0	1	Food		Soybean Processing	Spontaneous Combustion			
13	1984	2/23/1984	OH	0	1	Inorganic	hydraulic press	fireworks manufacturing company; chemicals and chemical preparations	Unknown			
14	1984	6/8/1984	IL	1	3	Food		Corn Gluten Pelletizing Plant	Unknown			
15	1984	6/15/1984	OH	1	4	Coal	Boiler furnace	Electric services	Hot surface			

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U.S. Chemical Safety and Hazard Investigation Board, Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
16	1984	6/19/1984	IA	1	1	Metal	Dust collection system, wheelabrator (Goff airless shot blast equipment for polishing aluminum)	aluminum foundry	Spark	1	1	1
17	1984	7/18/1984	CA	0	0	Coal	Coal bin	cement producer	Spontaneous combustion			
18	1984	7/23/1984	CO	1	2	Coal	coal pulverizer	Electric services	Unknown			
19	1984	8/10/1984	WV	2	0	Coal	"brady" conveyor belt	Primary Production of Aluminum	Hot surface			
20	1984	8/31/1984	NH	0	1	Metal	Time-saver sanding machine	Telephone and Telegraph Apparatus	Spark			
21	1985	2/14/1985	OR	0	1	Wood	Hopper	Reconstituted Wood Products	Metal strike			
22	1985	4/3/1985	IL	1	13	Inorganic	Electric equipment	animal pesticide packaging plant	Flame			
23	1985	6/4/1985	WY	0	3	Coal	coal pulverizer; air pressure fan; air fan shroud	Electric Services	Hot surface	1		3
24	1985	6/12/1985	IA	0	1	Food		Wet Corn Milling	Fire			
25	1985	6/18/1985	NM	0	0	coal	Grinding mill	cement producer	Unknown			
26	1985	6/24/1985	VA	0	7	Wood	Dust collection system	Wood Household Furniture	Unknown	1		7
27	1985	8/2/1985	UT	0	0	Inorganic	dust collection system, dryer, and baghouse	manufacturer of Guided Missiles and Space Vehicles	Static	1		

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U.S. Chemical Safety and Hazard Investigation Board, Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
28	1985	10/24/1985	GA	1	2	Plastic	vertical bucket container; light device w/extension cord	gum and wood chemicals	Electrical			
29	1986	2/28/1986	WI	0	4	Wood	incinerator; propane heater	manufacturer of "smoke" flavoring for food products (pyrolysis technology)	Flame			
30	1986	6/18/1986	CA	0	4	Food		Malt Plant	Foreign Material			
31	1986	7/1/1986	OH	1	1	Metal	mixing tank; drum of aluminum powder	chemical and chemical preparations	Metal strike			
32	1986	7/22/1986	IL	0	1	Plastic	mixing tank	manufacturer of Adhesives and Sealants	Static			
33	1986	7/29/1986	MN	0	2	Coal	2 portable quartz light devices; dust collector	Electric Services	Hot surface	1		2
34	1986	9/8/1986	TN	1	1	Wood	Dust collection system	Hardwood Dimension and Flooring Mills	Unknown	1	1	1
35	1986	9/13/1986	OH	2	0	Food	bridge conveyor	Marine Cargo Handling	Fire			
36	1986	12/15/1986	IL	0	0	Food		Alcohol Plant	Hot Bearing			
37	1986	12/31/1986	VA	0	2	Wood	boiler/firebox	Hardwood Dimension and Flooring Mills	Fire			
38	1987	2/4/1987	NY	1	5	Metal	grinder, aluminum fuser rolls	Coating, Engraving, and Allied Services	Unknown			
39	1987	3/18/1987	AL	1	0	Wood	Saw dust burner	manufacturer of furniture	Flame			

Attachment 2
U.S. Chemical Safety and Hazard Investigation Board, Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
40	1987	3/27/1987	IN	1	2	Metal	Dust collection system	steel plant	Unknown	1	1	2
41	1987	4/8/1987	IN	1	0	Plastic	Mixer	fabricator of rubber products	Unknown			
42	1987	6/10/1987	UT	0	6	Metal	surface dresser belt sander metal finishing machine; dust collection system	sheet metal work	Unknown	1		6
43	1987	9/13/1987	AL	0	0	Food		Wet Corn Milling	Fire			
44	1988	1/14/1988	MN	0	0	Food		Corn Wet Milling	Metal Sparks			
45	1988	3/19/1988	CA	0	3	Food		Sugar Processing	Unknown			
46	1988	3/30/1988	NJ	0	2	Pharmaceutical	reactor; charge port	pharmaceutical manufacturing				
47	1988	4/15/1988	NC	0	2	Wood	production belt sander	hardwood veneer and plywood manufacturer	Unknown			
48	1988	5/12/1988	OH	1	8	Metal	Dust collection system	Electric and Gas Welding and Soldering Equipment	Unknown			
49	1988	7/13/1988	OH	1	2	Metal	30-ton ladle; Alliance overhead cab crane	steel foundry	Hot surface			
50	1988	11/19/1988	OH	1	0	Plastic	Hopper	plastics materials, synthetic resins, and nonvulcanizable elastomers	Hot surface			

Attachment 2
U.S. Chemical Safety and Hazard Investigation Board, Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
51	1988	12/2/1988	MN	0	0	Food		Oat Mill	Unknown			
52	1988	12/2/1988	AL	1	0	Wood	mill boiler; Dust collection system	paper product manufacturer	Unknown	1	1	
53	1989	1/1/1989	PA	1	0	Metal	Hand brush; mixing drum	Secondary nonferrous metals	Static			
54	1989	1/25/1989	MI	0	1	Food	hammer mill/pulverizer	food preparations	Hot surface			
55	1989	2/3/1989	KS	0	0	Food		Bulk Feed Warehouse	Electric Sparks			
56	1989	2/14/1989	IA	0	0	Food		Chemical Processing Plant	Fire			
57	1989	3/2/1989	PA	1	2	Metal	Dust collection system; grinder/polisher	Fabricator of Wire Products	Spark	1	1	2
58	1989	5/12/1989	IL	0	0	Food		Wet Corn Milling	Hot Metal			
59	1989	7/13/1989	AR	0	7	Plastic	Unknown	Miscellaneous Fabricated Wire Products	Static			
60	1989	8/7/1989	IN	0	2	Wood	Tyler model 2400 multi-spindle panel router s/n2984-87	Unsupported Plastics Profile shapes	Hot surface			
61	1989	10/24/1989	MN	0	0	Coal	conveyor belt, coal crusher unit	power plant				
62	1989	11/13/1989	IA	0	0	Food		Wet Corn Milling	Unknown			
63	1989	11/22/1989	IA	0	0	Food		Starch Plant	Fire			
64	1990	1/17/1990	OH	2	1	Metal	Magnesium batching hopper	Chemical preparations facility	Metal strike			
65	1990	2/19/1990	OR	0	9	Wood	natural gas heater	cardboard box manufacturer	Unknown			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
66	1990	3/31/1990	IN	0	7	Metal	Lincoln arc welder #6251; Type N Roto-Clone dust collection machine	electrical generation plant	Spark	1		7
67	1990	4/20/1990	MD	0	2	Metal	Elevator	Electrometallurgical Products	Unknown			
68	1990	6/21/1990	AR	2	0	Metal	Dust collection system	nonferrous metals	Unknown	1	2	
69	1990	6/29/1990	PA	0	2	Metal	Pneumatic feed; hammer mill	Nonferrous foundries	Unknown			
70	1990	9/27/1990	IL	0	0	Food		Wet Corn Milling	Hot Metal			
71	1990	10/22/1990	CA	0	1	Textile	battery condenser	cotton ginning/agriculture services	Unknown			
72	1990	11/5/1990	MI	0	0	Food		Bulk Flour Station	Fire			
73	1990	11/9/1990	MD	0	1	Metal	welding device; dust collector	Electrometallurgical Products	Fire			
74	1990	11/27/1990	VA	2	0	Wood	Pneumafil Baur filter	reconstituted wood products	Hot surface			
75	1991	4/1/1991	IA	0	0	Food		Starch Plant	Unknown			
76	1991	4/11/1991	OR	0	1	Wood	bag house, rubber-handled trouble light, dust collection system	sawmill	Hot surface			
77	1991	6/6/1991	CA	1	1	Inorganic	granulator	pharmaceutical preparations	Unknown			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
78	1991	6/12/1991	NH	0	1	Plastic	Mikropal #3 micropulverizer (equipped with a .032 in. screen), Dust collection system	special industry machinery	Metal strike	1		1
79	1991	9/1/1991	NM	1	2	Wood	conveyor belt	reconstituted wood products	Unknown			
80	1991	9/21/1991	CA	0	2	Metal	machine press, acetylene torch	Plastics Materials and Basic Forms and Shapes	Flame			
81	1991	9/24/1991	IA	0	0	Food		Cereal Plant	Spark			
82	1991	12/17/1991	MI	0	11	Inorganic	Machine/ Vacuum system		Spark from tool			
83	1992	6/3/1992	RI	0	2	Food		Toy Mfg.	Unknown			
84	1992	7/31/1992	MD	0	1	Metal	hopper	Electrometallurgical Products				
85	1992	10/3/1992	IN	1	0	Metal	mixer, dust collector hose	industrial furnaces and ovens	Static	1	1	
86	1992	11/18/1992	SD	0	2	Wood	Dust collection system	reconstituted wood products	Unknown	1		2
87	1992	12/4/1992	NC	0	5	Wood	Silo	hardwood veneer and plywood manufacturer	Fire			
88	1993	1/6/1993	NY	2	2	Pharmaceutical	Oven	vitamin and food supplement manufacturer	Flame			
89	1993	2/8/1993	NH	0	8	Wood	Diehl rip saw, dust collection system	shoe manufacturing	Unknown	1		8
90	1993	3/21/1993	IA	0	0	Food		Wet Corn Milling	Unknown			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
91	1993	3/24/1993	SC	2	2	Plastic	air arc gauge with Plasmarc and Mappgas; mixing tank	Plastics Materials, Synthetic Resins, and Nonvulcanizable Elastomers	Spark			
92	1993	4/26/1993	NY	0	0	Pharmaceutical	oven	vitamin and food supplement manufacturer	Unknown			
93	1993	5/12/1993	IN	0	1	Plastic	Dust collection system, LaRouche machine, air-lay machine	manufacturer of pottery products	Metal strike	1		1
94	1993	5/17/1993	MN	1	0	Food		Food Plant	Unknown			
95	1993	9/3/1993	PA	1	0	Metal	Metal bucket	manufacturer of pressed and blown glass	Static			
96	1993	9/27/1993	OR	0	1	Wood	Unknown	industrial and personal paper products	Unknown			
97	1993	10/25/1993	NJ	0	9	Food		Candy Mfg.	Fire			
98	1993	12/2/1993	MD	0	1	Metal	Barrel	metal stampings	Explosion			
99	1994	4/21/1994	IA	0	0	Food		Bakery Mix Plant	Sparks			
100	1994	4/21/1994	IN	0	22	Coal	turbine generator hopper	Electric Services	Flame			
101	1994	5/28/1994	IA	0	0	Food		Starch Plant	Hot Metal			
102	1994	6/1/1994	MD	0	3	Wood	Sander	Cabinet manufacturer				
103	1994	6/16/1994	MN	0	2	Food		Malt Plant	Unknown			
104	1994	7/16/1994	CA	0	1	Textile	grinder, dust collection system	textile machinery	Spark	1		1
105	1994	9/14/1994	FL	0	0	metal	rubber hoses and grinder	Jet Parts Plant	grinding			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
106	1994	9/16/1994	AZ	1	6	chemical	metal duct	Vehicle parts and accessories	grinding			
107	1994	11/20/1994	NC	2	4	Wood	None	particle board manufacturer				
108	1994	12/16/1994	CA	0	2	Wood	Halogen light, Dust collection system	Facilities support services	Hot surface	1		2
109	1995	1/4/1995	KY	1	0	Metal	storage/conveyor tank	manufacturer of aluminium powder and paste	Unknown			
110	1995	2/28/1995	IL	2	25	Metal	conveyor booths	motorcycles, bicycles, and parts	Metal strike			
111	1995	3/24/1995	IL	0	4	Food		Wet Corn Milling	Explosive			
112	1995	3/25/1995	VA	0	1	Metal						
113	1995	5/22/1995	PA	0	1	Inorganic	steel hoe, flaker	industrial inorganic chemicals	Spark			
114	1995	7/30/1995	IL	1	0	Food	Flex hose	wet corn milling	Unknown			
115	1995	9/26/1995	IA	0	0	Food		Animal By-Product Plant	Spontaneous Combustion			
116	1995	9/29/1995	CA	0	6	Wood	Bin	lumber/wood products				
117	1995	11/16/1995	WA	0	0	Metal		aluminum metal product manufacturer	Unknown			
118	1995	12/11/1995	IA	0	0	Food		Wet Corn Milling	Unknown			
119	1995	12/11/1995	MA	0	37	Plastic	hopper	manufactures various types of textile products for upholstery and clothing	Spark			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
120	1995	12/13/1995	NH	0	0	Plastic	Dust collection system	Plastic manufacturing	Spark	1		
121	1996	1/9/1996	FL	1	0	Inorganic	pelletizer	motor vehicle parts and accessories	unknown			
122	1996	1/24/1996	AZ	0	3	Coal	Unknown	copper smelting	Fire			
123	1996	2/27/1996	IL	1	2	Coal	Dust collection system	Electric Services	Unknown	1	1	2
124	1996	3/4/1996	VA	0	1	Tobacco	dust collector	tobacco processing plant		1		1
125	1996	4/27/1996	CA	1	0	Metal	open blender/mixer	Industrial process furnaces and ovens	Unknown			
126	1996	6/25/1996	TN	0	1	Metal	Cutting device, dust collection system	primary metal products	Spark			
127	1996	7/10/1996	PA	0	0	Food		Brewery	Static Electricity			
128	1996	7/20/1996	NE	1	15	Food	screw conveyor, silo	Sugar Plant	Hot Metal			
129	1996	7/30/1996	VA	0	1	Plastic	Blending Tote	automobile brake pads and lining manufacturer				
130	1996	8/14/1996	NM	2	0	wood	hopper	sawmills and planing mills, general	fire			
131	1996	11/5/1996	UT	0	2	Metal	hopper, roller drum, shaker unit, "pig trailer"	Chemical preparations facility	Unknown			
132	1996	12/24/1996	PA	1	0	Metal	skip hoist, monorail system, 55 gallon drum	primary metal products	Unknown			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
133	1997	1/7/1997	IL	0	5	Paints	dust collection system, welding device	motor vehicle parts and accessories	Unknown	1		5
134	1997	1/10/1997	IL	0	5	Food		Wet Corn Milling	Unknown			
135	1997	2/13/1997	OH	0	2	Metal	electroplating, plating, polishing, anodizing, and coloring	buffing machines, dust exhaust system, baghouse, ductwork				
136	1997	4/16/1997	PA	2	0	Explosives	rail cart		black powder			
137	1997	5/16/1997	CA	0	1	Food		Bakery	Extension Light			
138	1997	5/18/1997	CA	0	6	Food		Walnut Hulling	Fire			
139	1997	6/17/1997	OH	0	0	Food		Cereal Plant	Unknown			
140	1997	7/30/1997	UT	1	4	Chemical	Outside the batch dryer building	Ammonium Perchlorate Plant				
141	1997	9/12/1997	NJ	0	1	Organic oxidizer	welder	specialty cleaning, polishing, and sanitation preparations	hot surface			
142	1997	9/30/1997	CT	0	3	Plastic	ventilation ducts	finishers of broadwoven fabrics of manmade fiber and silk	fire			
143	1997	10/20/1997	MN	0	0	Food		Soybean Processing	Fire			
144	1997	11/24/1997	OH	0	2	Metal	hardware	dust collection system, ductwork				

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
145	1997	12/18/1997	TX	1	4	Metal	thermal aluminum spray coating guns	metal coating and allied services	Unknown			
146	1998	1/5/1998	PA	0	0	Metal	Dust collection system	steel manufacturer		1		
147	1998	3/24/1998	NC	0	2	Wood	Dust collection system; mating flange gasket	wood/household furniture	Fire	1		2
148	1998	3/27/1998	NH	0	0	Wood		firearms manufacturer				
149	1998	4/11/1998	CA	0	1	Wood	sander	softwood veneer and plywood	Unknown			
150	1998	4/13/1998	IL	0	0	Plastic	Dust collection system	Fabricated Rubber Products	Unknown	1		
151	1998	5/4/1998	TX	1	1	metal	manlift; storage bin	scrap and waste materials	hot surface			
152	1998	5/17/1998	TN	0	2	Food		Frozen Dough	Halogen Lamp			
153	1998	7/1/1998	CA	0	1	Wood	baghouse, grinder	Wood products	Unknown	1		1
154	1998	7/1/1998	MS	0	4	Plastic	Injection molding	manufacturer of surgical and medical instruments	Hot surface			
155	1998	7/7/1998	KS	0	1	Food		Aircraft Plant	Electric Sparks			
156	1998	7/28/1998	IN	0	17	Coal	Tripper, Vacuum	Electric Services	Unknown			
157	1998	8/10/1998	CA	0	1	Wood	sander, dust collection system	manufacturer of drapery hardware, blinds and shades	Unknown	1		1
158	1998	8/28/1998	TX	0	1	Food		Sugar Plant	NA			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
159	1998	8/28/1998	TX	0	16	Plastic	dust collector; air handling ducts	sports equipment manufacturer	Unknown	1		16
160	1998	10/12/1998	OR	0	1	Wood	Unknown	lumber/wood products	Fire			
161	1999	2/1/1999	MI	6	30	coal	boiler	Power plant	Flame			
162	1999	2/17/1999	IL	1	0	Metal	Black & Decker electric sander, model 7441 (with 80 grit sandpaper)	plating and polishing	Fire			
163	1999	2/25/1999	MA	3	9	Plastic	Oven; dust collection system	Grey and duct tile foundries	Fire	1	3	9
164	1999	4/5/1999	AL	1	1	Metal	bucket elevator and shovel	nonferrous metals	Unknown			
165	1999	4/24/1999	VA	0	4	Wood	Silo	reconstituted wood products	Unknown			
166	1999	8/12/1999	MD	0	1	Inorganic	Dust collection system	Chemical preparations facility	Unknown	1		1
167	1999	8/16/1999	GA	3	4	Coal		Power plant				
168	1999	9/22/1999	NJ	0	2	plastic	machine that grinds plastic pellets	Plastic manufacturing	spark or malfunction			
169	1999	10/3/1999	CO	1	0	Wood	wood press	manufacture of reconstituted wood products	Unknown			
170	1999	10/4/1999	MS	0	1	Plastic	Rubber mixer machine	Tire manufacturer	Unknown			
171	2000	1/22/2000	NM	0	3	Food		Feed Warehouse	Welding/Cutting			
172	2000	2/3/2000	MO	1	0	Wood	Charcoal storage area	gum and wood chemicals	Fire			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
173	2000	2/3/2000	IN	1	0	Metal	Grinding machine	foundry (magnesium and aluminum)	Hot surface			
174	2000	3/7/2000	CA	0	1	Metal	Stretford style chemical reactor, used to clean steam and reduce SO ₂	electrical generation plant	Static			
175	2000	3/16/2000	CA	0	2	Metal	Grinding machine, dust collection system	metal fabrication and welding shop	Metal strike	1		2
176	2000	3/22/2000	NY	0	1	Food		Sugar Processing	Unknown			
177	2000	3/23/2000	TN	0	1	Food		Fiber Processing Plant	Fire			
178	2000	3/24/2000	CA	0	1	Metal	Bader polisher, dust-collection hopper	machining of metal tubes	Metal strike	1		1
179	2000	4/4/2000	CA	0	1	Wood	chop saw	Metal coating allied services	Metal strike			
180	2000	5/4/2000	TX	0	3	Food		Food Ingredient	Unknown			
181	2000	6/12/2000	PA	0	6	Plastic	mixer, series of screw conveyors, metal silos	plastics products	Unknown			
182	2000	7/5/2000	MD	0	1	Wood	pneumatic roof mounted conveyor system motor (Nu Vac); standard duty disconnect switch	Wood products	Unknown			
183	2000	8/17/2000	OH	0	1	Plastic	mixing vessel	Chemical preparations facility	Hot surface			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
184	2000	10/25/2000	OR	0	4	Wood		particle board manufacturer				
185	2000	10/26/2000	CA	1	4	Plastic	Dust collection system	Plastics materials and basic shapes	Unknown	1	1	4
186	2001	1/10/2001	NH	0	1	Wood	storage silo	Burial caskets	Metal strike			
187	2001	1/31/2001	KS	0	0	Food		Packaging Warehouse	Static Electricity			
188	2001	2/14/2001	PA	3	10	Wood	Unknown	Reconstituted Wood Products	Unknown			
189	2001	3/14/2001	MD	1	0	Inorganic	Dust collection system	Chemical preparations facility	Unknown	1	1	
190	2001	5/19/2001	IL	1	1	Food	Oven	Chocolate factory				
191	2001	5/25/2001	MI	0	9	Wood	Silo	particle board manufacturer	Wood Chips			
192	2001	8/29/2001	MT	0	2	Coal		electric services				
193	2001	9/8/2001	IL	0	0	Food		Cereal Plant	Sparks			
194	2001	9/21/2001	MI	0	2	Food		Milk Processor	Fire			
195	2001	10/3/2001	IN	5	0	Metal	Mechanical mixer	Chemical preparations facility	Unknown			
196	2001	10/15/2001	NV	1	3	Inorganic	Saw, vacuum cleaner	rocket propellant/motor manufacturing plant	Spark			
197	2001	12/11/2001	PA	0	2	Metal	dust collector	metal fabrication		1		2
198	2002	1/16/2002	MI	1	0	Coal	coal-fired boiler, coal feeding system	Electric Services	Fire			
199	2002	1/23/2002	NE	0	13	Plastic	Tire bin	Tire recycling				
200	2002	2/11/2002	OH	0	0	Plastic						
201	2002	2/13/2002	IL	1	2	Coal	hopper	Electric services	Hot surface			

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
202	2002	5/16/2002	MS	5	7	Plastic	Dust collection system, reversible screw conveyor	Fabricated rubber products	Hot surface	1	5	7
203	2002	5/26/2002	NJ	0	0	Food						
204	2002	6/6/2002	PA	0	3	Metal						
205	2002	6/10/2002	NC	0	0	Wood						
206	2002	7/19/2002	SC	0	0	Plastic						
207	2002	8/8/2002	OR	1	3	Food		Pelleting Plant	Unknown			
208	2002	8/8/2002	MS	1	0	Textile	cotton compress conveyor	Farm product warehousing and storage	Unknown			
209	2002	8/25/2002	TN	1	0	Metal	baghouse	Industrial Inorganic Chemicals	Static	1	1	
210	2002	9/5/2002	MN	1	4	Food			Static Electricity			
211	2002	9/20/2002	KS	0	0	Food		Distillery				
212	2002	11/18/2002	NC	0	3	Wood & plastic						
213	2002	12/26/2002	AL	1	0	Wood		Saw mills and planing mills	Metal strike			
214	2002	12/27/2002	ID	0	0	Wood						
215	2002	12/27/2002	WI	0	1	Metal						
216	2003	1/21/2003	IL	0	1	Plastic	Sandblasting booth	Industrial cleaning/sandblasting	Unknown			
217	2003	1/23/2003	MO	0	0	Wood						
218	2003	1/29/2003	NC	6	38	Plastic	Milling equipment	Mechanical rubber goods				
219	2003	2/10/2003	WI	0	0	Coal						
220	2003	2/14/2003	NC	0	2	Wood						
221	2003	2/20/2003	KY	7	37	Plastic	Oven					

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents Involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
222	2003	2/25/2003	TN	0	0	Wood						
223	2003	2/25/2003	TN	0	0	Wood						
224	2003	3/7/2003	NY	0	0	Wood						
225	2003	3/12/2003	PA	0	0	Wood						
226	2003	3/14/2003	MI	0	0	Metal						
227	2003	3/17/2003	PA	0	0	Metal	Dust collection system	metal polishing and grinding		1		
228	2003	4/9/2003	IN	0	0	Wood						
229	2003	5/20/2003	KY	1	3	Food	silo	candy manufacturer				
230	2003	5/23/2003	CA	0	2	Wood						
231	2003	5/30/2003	IA	0	1	Coal						
232	2003	7/9/2003	IL	1	1	Metal	torch		Flame			
233	2003	7/22/2003	SC	0	0	Plastic	grinder	pharmaceutical preparations				
234	2003	7/30/2003	SD	0	0	Metal						
235	2003	8/11/2003	OR	0	1	Wood						
236	2003	8/26/2003	NC	0	0	Food		Food Processor				
237	2003	9/2/2003	MA	0	1	Wood	Unknown	reconstituted wood products	unknown			
238	2003	9/5/2003	OH	0	0	Plastic						
239	2003	10/1/2003	OH	2	9	Wood						
240	2003	10/22/2003	KY	0	0	Plastic						
241	2003	10/29/2003	IN	1	2	Metal	multi-cone pipe, multi-cone blower, dry chip blower					
242	2004	1/12/2004	IA	0	0	Food		Wet Corn Milling				
243	2004	1/15/2004	OR	0	2	Wood						
244	2004	2/11/2004	NE	0	0	Wood	cutting device, dust collector	store fixtures manufacturer	Spark	1		

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
245	2004	2/12/2004	IL	0	0	Coal	steel storage bunker	power plant				
246	2004	2/16/2004	OK	0	0	Coal	Coal handling system	Power plant	Unknown			
247	2004	2/19/2004	OH	0	3	Wood	Dust collection system	Woodworking Company	Metal to metal strike	1		3
248	2004	2/23/2004	MI	0	0	metal	Dust collection system	foundry	Excessive heat	1		
249	2004	3/16/2004	AR	0	0	Wood	panel saw, dust collector	hardwood veneer and plywood		1		
250	2004	3/16/2004	OK	0	0	Plastic	Dust collector	Tire manufacturing plant	Spark			
251	2004	3/17/2004	WA	0	2	Wood						
252	2004	4/6/2004	KS	0	0	Food		Packaging Warehouse				
253	2004	4/7/2004	IL	0	0	Coal	excavator crane, welding equipment	power plant	Unknown			
254	2004	4/8/2004	NC	0	1	Food						
255	2004	5/6/2004	WI	0	0	Wood						
256	2004	5/16/2004	NJ	0	0	Pharmaceutical	dust collector	Industrial Inorganic Chemicals	unknown	1		
257	2004	6/10/2004	NC	0	3	Plastic	drums					
258	2004	6/25/2004	WI	0	4	Metal	Buffing machine, Air scrubber, duct work	manufacturing plant	Spark	1		4
259	2004	7/6/2004	TX	1	2	Metal	Grinding	manufacturing plant	unknown			
260	2004	7/20/2004	CT	0	2	Plastic	grinding machine	rubber factory	Metal strike			
261	2004	9/14/2004	OH	0	1	Metal		Steel Pipe and Tubes				

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
262	2004	9/16/2004	CA	0	0	Wood	ducts	Folding Paperboard Boxes				
263	2004	9/18/2004	MA	1	16	Food	baghouse	tofu manufacturer	Unknown	1	1	16
264	2004	9/23/2004	IL	0	0	Wood	dust collection system	Wood Office and Store Fixtures, Partitions, Shelving, and Lockers	Metal strike			
265	2004	9/28/2004	IL	0	0	Coal						
266	2004	10/12/2004	IN	0	0	Plastic	dust collector	foam insulation manufacturer	Unknown	1		
267	2004	11/23/2004	IL	0	0	Plastic						
268	2004	12/3/2004	OH	0	1	Wood	silo	pet food manufacturer	Hot surface			
269	2004	12/8/2004	MD	0	0	Wood						
270	2005	2/25/2005	KY	0	2	Plastic	Rubber mixer machine	Tire Manufacturer	Unknown			
271	2005	5/3/2005	CA	0	2	Pharmaceutical		pharmaceutical manufacturing	spark			
272	2005	6/1/2005	IA	0	1	Inorganic	Cutting torch	Tire Manufacturing	Cutting torch			
273	2005	6/10/2005	TN	0	5	Paints	Paint booth, cutting torch					
274	2005	7/4/2005	WA	0	0	Organic	dust collector	cement plant		1		
275	2005	7/8/2005	ME	0	0	Wood	Paper machine	paper product manufacturer	Unknown			
276	2005	7/22/2005	WI	0	2	Metal	Dust collection system	Muffler manufacturer		1		2
277	2005	7/26/2005	OR	0	0	Wood	Bag House, sawdust collection in pockets	Wood Products Manufacturing Plant		1		

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Incident #	Year	Date	State	Fatality	Injury	General Fuel Category	Equipment Involved	Facility Type	Ignition Source	Incidents involving Dust collection	Fatalities Involving Dust Collection	Injuries Involving Dust Collection
278	2005	10/14/2005	WI	1	1	Wood	Wood flour mills	Wood Products Manufacturing Plant				
279	2005	11/9/2005	IL	0	0	Chemical	powder-coating machine	Display manufacturing plant				
280	2005	11/14/2005	IA	0	2	Wood		Wood Products Manufacturing Plant				
281	2005	11/17/2005	MT	0	1	Chemical		Chemical facility	spark			
Totals:				119	718					51	21	134
% of Incidents involving dust collection devices:										18%		
% of Fatalities involving dust collection devices:											18%	
% of Injuries involving dust collection devices:												19%

Note: Above Table is Appendix A in referenced Report. Final 3 columns and dust collection incident rate summaries added to USCSH report by WFW.

Background on Combustible Dust Hazard Investigation 1-Oct-04, Appendix A

In 2003, the CSB launched investigations of three major industrial explosions involving combustible powders. These explosions - in North Carolina, Kentucky, and Indiana - cost 14 lives and caused numerous injuries and substantial property losses. The Board responded by launching a nationwide study to determine the scope of the problem and recommend new safety measures for facilities that handle combustible powders.

References:

http://www.chemsafety.gov/index.cfm?folder=current_investigations&page=info&INV_ID=53
http://www.csb.gov/completed_investigations/docs/DustIncidentDataFileFinal.xls

Attachment 3

Capital Cost Information Used to Develop Cost Benefit Ratios Typical Powder River Coal Mine Dust Control Retrofit Cost Analysis:

Table 1. Plant Dust Control Retrofit Study, Coal Mine Conveying, Transfer & Crushing

Treatment Method	Capital plus 30 Yrs O&M	30 Yr Expense Ratio vs Fog
Atomizing Fog	\$1,514,023	1.00
PECs Transfer Chutes	\$2,010,024	1.33
Dust Scrubbers	\$2,329,104	1.54
Upgrade Former Baghouses ¹	\$3,884,563	2.57
New Baghouses ²	\$6,003,785	3.97

¹Upgrades necessary to make four former baghouses less prone to fires.

²Sargent & Lundy, 2008, for replacement of 4 baghouses meeting new EPA standards, at cost of \$125/ascm.

Table 2. Calculation of Incremental Dust Improvement of Subpart Y baghouse proposed emissions.

Dust Collector Baghouse Number	Calculated Tons Emitted if no Control*	Current Allowed TPY @99.7%	Subpart Y Proposed Emissions TPY @99.9%	Baghouse to Baghouse reduced tpy if Subpart Y
DC-01	1,466.67	4.4	1.47	2.93
DC-02	569.13	1.7074	0.57	1.14
DC-03	1,000.44	3.00131	1.00	2.00
DC-04	468.70	1.4061	0.47	0.94
Total:	3504.94	10.51	3.50	7.01

*example, DC-01 is now 99.7% efficient and allowed to emit 4.4 TPY.

For DC-01, 1466.67 tpy dust * .003 = 4.4 tpy emitted through baghouse.

If modified as per pending Subpart Y, DC-01, 1466.67 tpy dust * .001 = 1.47 tpy emitted through baghouse.

Remainder calculated the same way.

Table 3. Cost Benefit Ratio, various dust control options for coal conveying, transferring and crushing

Treatment Method	Capital plus 30 Yrs O&M	Entire Plant Dust Reduced per year (tons)	Cost/yr/ton Reduced to treat	30 Yr Life Cost Ratio vs Co 2 Fog
Atomizing Fog	\$1,514,023	3504.94	\$14.40	1.00
PECs Transfer Chutes	\$2,010,024	3504.94	\$19.12	1.33
Dust Scrubbers	\$2,329,104	3501.43	\$22.17	1.54
Upgrade Existing Baghouses	\$3,884,563	3494.42	\$37.05	2.57
New Baghouse Costs	\$6,003,785	3501.43	\$57.16	3.97

Above table assumes dust scrubbers could also meet the proposed 0.005 gr/dscfm

Attachment 4

Copy of Typical Shift Report documenting Daily Visible Emissions Monitoring

Copy of Typical O&M Report, Atomizing Fogger Maintenance

Reporting Tech Feddersen, Ro				Plant Loadout Daily On-Shift Inspection		Trains Loaded:		
Date	07/01/08							
Shift	D							
Crew	B							

Location	Initials	Spot Check	Washdown		Location	Initials	Spot Check	Washdown	
			Auto	Hand				Auto	Hand
Area around Load-out Building: Check Tioga	RF				Reclaim Area Silo 3: Check Hyd. System	RF			
✓ Bobcat Skid Steer Loader					✓ Tail of CV03	RF			
✓ Bobcat Shed	RF				✓ MCC 2	RF			
✓ RR Tracks Area	RF				✓ Modine Heater	RF			
✓ Fire Suppression Room	RF				✓ Sump Pumps	RF			
Load-out Building: Check Locker Room	RF				Elevator: Book Completed	JS			
✓ Loadout Air Compressor, Dry Fog	RF		Clean & Mop MCC3		Silo 3 Headhouse Both Levels	RF			
✓ MCC 3	RF				✓ CV-06 Drive Motor & Gearbox	RF			
✓ MCC 3 Halon System	RF				✓ Hoist	RF			
✓ Control Room	RF				✓ Doors	RF			
✓ Control Room Halon System	RF				✓ CV06 Gallery	RF			
✓ Discharge Gates, Cylinders, Hyds	RF				Silo 2 Headhouse Both Levels	RF			
✓ 2 nd Floor-Load Cells	RF				✓ Modine Heater	RF			
✓ Take-up Tower, Pulleys, Bearings	RF				✓ Tail of CV02	RF			
✓ Batch Gates, Cylinders, Hyds.	RF				✓ Tail of CV06	RF			
✓ Hydraulic System, Piping, Clamps	RF				Silo 1 Headhouse, CV02 Gallery	RF			
✓ 4 th Floor-Secondary Cutter	RF				✓ CV-02 Drive Motor & Gearbox	RF			
✓ Take-up Tower, Pulleys, Bearings	RF				✓ Hoists	RF			
✓ 5 th Floor-Sample Crusher	RF				✓ Warm Up Shack	RF			
✓ Primary Cutter, Gearbox, Bearings	RF				Top Floor Top Silo 2: CV01 Head House	RF			
✓ Sample Belt, Dry Fog	RF				✓ CV-01 Main, Creep Drives & Holdback	RF			
✓ Top Floor, Skirtboard, Chutework	RF				✓ Doors	RF			
✓ Hoist	RF				✓ CV01 Gallery	RF			
✓ Is visible dust outside top of loadout bldg & CV04 Galley (yes, no)	NO				✓ Is visible dust outside CV01 & top of silo structures (yes, no)	NO			
✓ CV-04 Main, Creep Drives & Holdback	RF				✓ Hoist	RF			
CV04 Conveyor Gallery	RF				Truck Dump:	RF			
✓ CV04 Belt, Idlers, Pulleys, Plows	RF				✓ MCC 1	RF			
Transfer Building: Check Tioga	RF				✓ Bottom of Truck Dump, Tail CV01	RF			
✓ Bottom Floor Transfer Building, Sump	RF				✓ Compressor Room	RF			
✓ CV04 Tail Pulley, Plow, Chutework, Skirtboard	RF				✓ Gundlach Crusher, Lube system, N2	RF			
✓ Fire Room	RF				✓ Stamler Breaker, Drives, Flight Chains	RF			
✓ Top of Transfer Building, Cleaners, Chutes	RF				✓ Stamler Hydraulic Unit, TD Hopper	RF			
✓ CV-03 Main, Creep Drives & Holdback	RF				✓ Penthouse, Hoist	RF			
✓ CV03 Belt, Idlers, Pulleys, Plows, Skirtboard	RF				✓ TD Grizzly, Stilling Shed, Structure	RF			
✓ Check DC03 dust bin and hopper	RF				✓ Stilling Shed Baffles	RF			
✓ If full was dust bin emptied	RF				✓ Cat IT Loader	KC			
Reclaim Area Silo 1: Check Hyd. System	RF				✓ Hitachi Trackhoe				
✓ Fire Room	RF				✓ CV01 Take-up (Counterweight)	RF			
Reclaim Area Silo 2: Check Hyd. System	RF				✓ Methane check in all areas	RF			
✓ Tioga	RF				Loadout Hours	0	Silofeed Hours	0	

Problems / Concerns / Action Taken: (Methane checks in all areas - if there is a reading greater than 0.0, enter reading in Spot Check column)

System	Initials	Problem Found
Electrical Problems		
Mechanical Problems		

Work Performed:

crew change briefing
 visual inspection of prep plant
 control room ops/reports
 inspect support equipment
 unloaded steel for new wash bay
 safety meeting with Kris
 cut teeth off on gundlach
 Josh B went to town to get fit tested

Completed by: _____

Countersigned: _____

Weather

Temp

Completed by: _____

Silofeed Dry Fog System
Monthly PM

Bottom of Truckdump

Name: Tom / Aaron

Date: 6-8-08

Initials

- 1 Turn on Fog Sections Manually. Make sure air and water are enabled at truck dump compressor room. Done: TW

- 2 Check all Cabinets. Clean as needed. Done: TW

- 3 Is Air Pressure in normal range? Maintain air compressor as needed. Replace air filter semi-annually, or when dirty. Regulated air pressure 70-80 psi
Part# NAD5000DRK

Start	Finish
70	70

- 4 Is Water Pressure in normal range? Regulated water pressure 12-15 psi
Replace water filter gasket quarterly, or when broken. Part# S7963
Flush or replace water filter cartridges when discolored to within 1/2 inch of center.
Part# MB5-10

Start	Finish
15	15

- 5 Is Heat Trace System Operating Light on? Yes: No: TW
Maintain as needed.

Summer

- 6 Inspect all spray nozzles for proper operation. Clean or replace as needed. Done: TW/AG

- 7 Inspect all lines for leaks. Maintain as necessary. Done: TW/AG

- 8 Clean around fogger locations to be sure that they are visible, accessible and undamaged. Check mounts for tightness. Done: TW/AG

- 9 Make all necessary repair to module enclosures. Inspect internals of all modules. Repair any leaks, replace gauges that do not zero properly, clean interior and be certain module doors are closed and bolted tightly. Done: TW/AG

Comments:
