HOW SHOULD THE FEDERAL GOVERNMENT ADDRESS THE HEALTH AND ENVIRONMENTAL RISKS OF COAL COMBUSTION WASTE?

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

OF THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

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CONTENTS

	Page
Hearing held on Tuesday, June 10, 2008	1
Statement of Members:	
Costa, Hon. Jim, a Representative in Congress from the State of California	2
Prepared statement of	3
Faleomavaega, Hon. Eni F.H., a Delegate in Congress from American Samoa	6
Gohmert, Hon. Louie, a Representative in Congress from the State of Texas	4
Sarbanes, Hon. John, a Representative in Congress from the State of Maryland	5
Statement of Witnesses:	
Burke, Dr. Thomas, Director, Risk Sciences and Public Policy Institute, Johns Hopkins Bloomberg School of Public Health, Oral statement on behalf of Mary A. Fox	40
Evans, Lisa, Project Attorney, Earthjustice	45
Prepared statement of	47
Fox, Mary A., Ph.D., MPH, Assistant Professor, Johns Hopkins Bloomberg School of Public Health, Statement submitted for the record	42
Goss, David, Executive Director, American Coal Ash Association	16
Prepared statement of	18
Harvey, Norman K., President, Greater Gambrills Improvement Association	58
Prepared statement of	60
Norris, Charles H., Consultant, GeoHydro, Inc.	30
Prepared statement of	32
Squillace, Mark, Professor of Law and Director, Natural Resources Law Center, University of Colorado School of Law	8
Prepared statement of	10
Wilson, Shari T., Secretary, Maryland Department of the Environment	12
Prepared statement of	15
Additional materials supplied:	
Bangert, Suzanne, Director, Bureau of Waste and Materials Management, Wisconsin Department of Natural Resources, Letter submitted for the record	67

OVERSIGHT HEARING: "HOW SHOULD THE FEDERAL GOVERNMENT ADDRESS THE HEALTH AND ENVIRONMENTAL RISKS OF COAL COMBUSTION WASTE?"

Tuesday, June 10, 2008
U.S. House of Representatives
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:10 a.m. in Room 1334, Longworth House Office Building, Hon. James Costa [Chairman of the Subcommittee] presiding.

Present: Representatives Costa, Faleomavaega, Gohmert, Smith, Scalise and Sarbanes.

Mr. COSTA. The oversight hearing of the Subcommittee on Energy and Mineral Resources will now come to order. We are pleased that everybody is here this morning and look forward to an informative oversight hearing on subject matter dealing with the issues of coal combustion waste, how we deal with the waste stream.

We know that coal is a very important energy source for America presently and in the future, so before we get on with the subject matter let me first go through some preliminary housekeeping efforts that I have to deal with.

The Subcommittee is meeting today to hear the testimony on how the Federal Government should address the health and environmental risks that deal with coal combustion waste. States, of course, are doing a number of different things, and we are looking forward to hearing what our respective states are doing.

Under Rule 4[g], the Chairman and Ranking Minority Member, who is my friend here next to me, Congressman Louie Gohmert from Texas, may make opening statements. If any Members have any other statements, they may be included in the record under unanimous consent.

Additionally, under Rule 4[h] additional material for the record should be submitted to Members or witnesses within 10 days after the hearing so that way it gives us time to get a response back. I would appreciate the witnesses' cooperation in responding to any questions submitted to you in writing after the hearing, so we will follow through in that fashion.

We have, I think, a couple of opening statements here. Let me begin with mine.

STATEMENT OF THE HONORABLE JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. COSTA. The question, of course, on this oversight hearing is whether or not the Federal Government should address health and environmental risks of coal combustion waste. We know that there is currently a rulemaking taking place, but this is the first time in a decade that this Committee has examined the important issue of coal combustion waste management.

Why now? Well, I think there is a great deal of interest. Chairman Rahall has for many years, coming from the State of West Virginia, been interested in the problems associated with the need to ensure our ability to use coal as an important energy source, but as a gentleman from West Virginia and familiar with the coal industry, he knows that coal waste management is an issue that has to be dealt with and has had to be dealt with really since the 1980s since we became more aware of the challenges that we deal with.

Unfortunately, the problem of how to handle coal combustion waste is growing. While there are solutions I believe that have been implemented, coal, a fundamental of our present and future energy supply, is critical for America's energy security. Coal-fired power plants generate half of the nation's electricity, but at the same time it yields approximately 125 million tons of coal waste a year that must be dealt with.

Recent reports have raised serious questions about the management of the coal byproducts like fly ash, and we will hear more about that from our colleague, Congressman John Sarbanes.

The Environmental Protection Agency has identified 67 cases in which they believe there is impact to human or ecosystem health from coal combustion waste. States regulate coal combustion waste throughout America, but obviously those regulatory formulas vary from state to state.

In 2006, Chairman Rahall requested that the National Research Council analyze what would be the best management practices to in fact deal with the management of coal combustion residues in mines. The Council report determined that coal waste does cause problems, serious problems, at or near mines that are being used as disposal sites, yet they are an important avenue for that waste disposal. The report recommended enforceable Federal standards for mine placement as it relates to the coal waste.

Today, the hearing from my perspective as Chairman of this Subcommittee is the following: First, to gain a better understanding of the dangers that coal waste can pose if we don't manage it properly.

Two, to get input from the two panels to determine what regulation is appropriate for coal waste disposal and whether there is some sort of combination of management tools that involve landfills, quarries or mines that can be best utilized to deal with the coal waste byproducts.

In addition, I would like to examine how we can promote the reuse of coal waste in products like concrete. I have been informed that the State of Wisconsin, for example, reuses 85 percent of the

coal waste, much of it in concrete. That is the highest percentage in the country.

So what are the opportunities, as we listen to the experts this morning, to minimize the coal waste stream and to reuse it in ways that are good for the economy and provide good byproducts that have value added?

In closing, obviously, in my opinion anyway, coal will continue to be a critical part of America's energy supply, but we should also at the same time use the best management practices so as to ensure the pollution from coal waste should not be a problem extended into the future that the next generation of Americans will have to deal with.

I look forward to learning how we can ensure that commonsense safeguards and commonsense cost-effective ways in which we can protect people, our communities and our water supplies and, at the same time, continue to ensure that coal will be a very important part of America's long-term energy supply.

At this time, I would like to recognize my colleague, if you want me to defer, the Ranking Member.

[The prepared statement of Mr. Costa follows:]

Statement of The Honorable Jim Costa, Chairman, Subcommittee on Energy and Mineral Resources

Today's hearing is the first time in at least a decade that this Committee has focused on the important issue of coal combustion waste management. I expect, however, that this will be just the beginning of our examination of coal waste. Although our Committee's chairman, Mr. Rahall, has sought solutions to the problem of coal waste management since the 1980s, many of us on this Subcommittee are just beginning to learn about the environmental and health risks of coal combustion waste, and options for its safe management. We intend to hold additional hearings on coal combustion byproducts in which we can gain input from other perspectives, including federal agencies like the Environmental Protection Agency and the Office of Surface Mining, on how best to address the waste challenge safely and sustainably.

Why hold this hearing now? First, because the problem of how to handle coal combustion waste is growing. Coal is a fundamental part of our present and future energy supply. Coal-fired power plants generate half the nation's electricity. But, they yield approximately 125 million tons of coal waste a year that we must reuse or dispose.

Secondly, the time is ripe for this hearing because recent reports raise serious questions about the management of coal byproducts, like fly ash. The Environmental Protection Agency has identified 67 cases in which human or ecosystem health have been compromised by coal combustion waste. And, the Agency's draft risk assessment from 2007 revealed risks to human health and the environment from the disposal of coal waste in landfills and surface impoundments.

Another important report was published in 2006. At Chairman Rahall's request, the National Research Council analyzed how to safely manage coal combustion residues in mines. The Council's report determined that coal waste may cause problems at or near some mine disposal sites, and found gaps and inadequacies in state regulatory programs for coal waste disposal. The report recommended enforceable federal standards for mine placement of coal waste.

In short, today's hearing is an opportunity to gain a better understanding of the dangers coal waste can pose if mismanaged, and get input on what regulation is needed for coal waste disposal—whether in landfills, mines, quarries, or other kinds of sites.

I also think it is important that we examine how we can promote reuse of coal waste in products like concrete and roads. For example, Wisconsin reuses roughly 85% of its coal waste—the highest rate in the country. Caltrans, in my home state of California, is considered a leader among state transportation agencies because it requires the use of fly ash in concrete paving projects. A typical Caltrans project uses at least 25% fly ash as a replacement for Portland cement. What are the opportunities to minimize the coal waste stream nationwide, as Wisconsin and California are striving to do?

My personal belief is that coal will continue to be a critical part of our energy supply—but pollution from coal waste should not be part of America's future. I look forward to learning how we can ensure that common sense safeguards are in place for people, communities, and water supplies.

Mr. GOHMERT. I will go ahead.

Mr. COSTA. OK. We will have the Ranking Member, the gentleman from Texas, with his opening statement, and then I will defer to the gentleman from Maryland. Mr. Gohmert?

STATEMENT OF THE HONORABLE LOUIE GOHMERT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. GOHMERT. Thank you, Chairman Costa. Thank you for holding this hearing today. It is always good when the Committee gets an opportunity to focus on energy production and its byproducts.

Especially today since approximately 50 percent of the nation's electricity is generated from coal-fired power plants, about half of the byproducts of the combustion of coal are recycled and used for beneficial uses such as wallboard cement, road construction and—well, it helps benefit soil. There you go. The remainder of the material is placed in landfills, surface impoundments or used in mine reclamations.

The use and disposal of coal combustion byproducts has been studied for decades by EPA beginning in 1980 with the passage of the legal amendment to the Resource Conservation and Recovery Act. EPA made a formal regulatory determination in 1993 that coal combustion byproducts were not hazardous. After additional studies they reiterated this finding in 1999 during the Clinton Administration and again in 2000, again during the Clinton Administration.

In their 2000 Federal Register notice, they announced their intention to develop national standards under the Solid Waste subtitle of the Resource and Recovery Act for disposal of the coal combustion byproducts in landfills, surface impoundments and mines.

EPA's developments have been delayed by repeated requests from numerous organizations and activist groups for additional studies, including a study conducted by the National Research Council titled Managing Coal Combustion Residues in Mines.

As a result of that study published in 2006, the Office of Surface Mining, in concert with EPA, has been working on establishing Federal standards for the disposal of coal combustion byproducts in mines as part of their Surface Mining Control and Reclamation Act. Barring another lawsuit or further delay, these regulations will be final early next year.

For some reason neither the EPA or OSM were invited to testify today at this hearing entitled "How Should the Federal Government Address the Health and Environmental Risks of Coal Combustion Waste." It seems sometimes helpful to me to ask those that are doing the studies how they are doing the studies and what results they have, what help that we might could better be to them since they are the ones going through the study rather than merely hearing their critics.

It seems to me both agencies could have had important information and substantive data to share with the Committee in their

oversight of this issue. In particular, the extent and magnitude of surface and groundwater contamination from the disposal of these coal combustion byproducts would be helpful.

Data recently made available by the EPA showed that out of 600 landfills and surface impoundments, only 24 had contaminated either surface or groundwater. I would like to ask the EPA or OSM what studies were done to be sure what percent of the 24 came from the landfills, and how many of those may have come from other causes. No contamination has been demonstrated, it is notable, as a result of disposal in mines.

A comprehensive oversight hearing today should have invited the EPA and the OSM to testify, whether we agree with them or not, to determine the results of their studies, their methodology and all that has been done over the last 28 years by the Federal Government, and where they are in the process of taking Federal action to address the concerns that will be raised by the witnesses today.

Regardless of the makeup of these panels, we are still focusing on an important issue, the disposal of coal combustion waste. Since we may have more coal than any other country in the world and since some in this country have a concern about the price of energy and the effect on hardworking Americans of its ongoing increases in price, this is certainly an important issue.

It is also notable that economies around the world that are struggling do very little, and in some cases nothing, to help the environment. Since the goal that many of us have is to make sure that we have a clean environment that we can pass on to our children and since struggling economies like China and India are more concerned about getting jobs for people so they don't revolt, then it is important to make sure hardworking Americans don't lose their jobs.

Or, as some of us have heard from people in my district, union people especially that are having difficult times paying for the gasoline to get to and from jobs, then it is important to give them the relief so, as one person told me two weeks ago, he doesn't lose his job because he can't afford the gas to get there.

According to the recent EIA Energy Outlook report, energy production from coal will grow just under 50 percent between now and 2030 unless we continue to do nothing but attack it. Identifying the proper methods of disposal with coal combustion waste is a very important subject, and I look forward to hearing from our witnesses and the expertise they will provide.

Thank you, Mr. Chairman.

Mr. COSTA. Thank you, Mr. Gohmert from Texas.

We will now have for an opening statement the gentleman from Maryland, Representative John Sarbanes.

STATEMENT OF THE HONORABLE JOHN SARBANES, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MARYLAND

Mr. SARBANES. Thank you, Chairman Costa. I am going to keep my opening remarks pretty brief because I am eager to hear from the panel that we have assembled here, but I want to thank you for holding the hearing today. I want to thank you for allowing me to participate on the Subcommittee's hearing.

The whole issue of fly ash and coal combustion waste generally is one that I have become much more sensitive to in recent months because of a situation in my district in Gambrills, Maryland, where there is fly ash dumping in a sand and gravel mine which, as far as we can tell, has caused several wells in the area to become tainted with toxic material.

If you look at the materials—and I was reading the testimony of the various witnesses last night—there are so many different potential harmful effects that can come from this coal combustion waste and the leaching that can occur, particularly as it gets into groundwater and then finds its way to the drinking water wells that people rely on.

So this is a very important hearing. Obviously we want to understand what some of those health effects are. We want to understand what the states are doing to try to respond to this emerging awareness of the threat and risk, and we want to understand what the appropriate Federal role may be in providing oversight and regulation with respect to how this coal combustion waste is disposed of.

You have discussed some of the beneficial reuse that can occur. That is something else to explore here, but I am particularly focused on the health effects and what we can do to combat them and prevent them.

We are lucky to hear today from Shari Wilson, who I know, who is the Secretary of the Maryland Department of Environment, who has responded to the particular situation that I mentioned at the outset aggressively, has an impressive background in defending the environment, and I am very interested to hear her perspective on how the state regulation and oversight of this issue can work as a compliment to what we may pursue at the Federal level.

We are also going to hear on the next panel from Norm Harvey, who is a resident of one of the communities that was affected, and I think getting his personal perspective on the impact it has had in his community is also critical to giving us a full awareness of the issue.

So I am looking forward to the testimony from the witnesses and I thank you again for bringing us together for this hearing. Thank you.

Mr. COSTA. I thank the gentleman from Maryland.

The gentleman from Nebraska, Mr. Smith? Do you have an opening comment?

[No response.]

Mr. COSTA. OK. Pass. Do you have a couple of comments, the gentleman from American Samoa?

Mr. FALEOMAVAEGA. One or two comments, Mr. Chairman, if that is all right.

Mr. COSTA. One or two. The Chairman is in a tolerant mood this morning. One or two comments. You don't want to go to three or four, though.

STATEMENT OF THE HONORABLE ENI F.H. FALEOMAVAEGA, A DELEGATE IN CONGRESS FROM AMERICAN SAMOA

Mr. FALEOMAVAEGA. I really wanted to attend this hearing. I serve on the Foreign Affairs Committee, and correct me if I am

wrong, Mr. Chairman, probably no other country in the world is more sensitive, especially as it relates to the usage of coal. We happen to have one of the biggest supplies in the world in our own country.

I notice also an interest. China relies tremendously on coal, and when you talk about environmental problems that we are faced with in the usage of this prime resource that is so common in many other countries in the world, the only question I raise is that while we are doing this domestically and internally making sure that we are environmentally protected and all of this, other countries don't even give a hoot about coal combustion waste because that is the only source of energy that they use without any concern for the environment and how this relates to our own sense of well-being.

In that area I am curious and wanting to see where do we go from here? We put standards on ourselves, which I think is commendable, but my question is will the other countries do the same? I think there is a big disparity here. We put more onus on our own people, our own companies and all of this, but nothing whatsoever to deal with other countries that use coal in such a way that we are not here for discussion, not even to discuss what coal combustion waste is all about.

That is just my point, Mr. Chairman, and thank you for the two minutes that you have allowed me to say this.

Mr. COSTA. We always love your participation, my good friend, the gentleman from American Samoa, and you are quite right to point that out, although I think that in China and maybe other parts of the world they are starting to turn the corner on this.

When they are hosting the Olympics, as they are this summer, and trying to figure out how they reduce the amount of emissions so that you can have enough air quality days so the athletes can compete, they know they have a problem.

Mr. FALEOMAVAEGA. If the gentleman would yield? China is spending over $40 billion just to prepare for the Olympics coming up in August, which is very interesting.

Mr. COSTA. Right.

Mr. FALEOMAVAEGA. And how this will affect our athletes that will be competing there? Absolutely no question. The air in China is terrible.

Mr. COSTA. Certainly it has gotten on their radar screen and they are aware, as are many of the countries whose athletes are going there, about the impact of the air quality, so consequently that is part of the tradeoff, although I will be wanting to point out to Members of the Subcommittee this morning that is not the subject of our hearing, but it is the interest of a lot of testimony, and I do appreciate that.

Let us get on with our first panel if that is all right with everyone. We would like to recognize the witnesses. We have Professor Mark——

Mr. SQUILLACE. Squillace.

Mr. COSTA.—Squillace. Is that right?

Mr. SQUILLACE. Yes.

Mr. COSTA. Squillace. Italiano?

Mr. SQUILLACE. Italiano. Si.

Mr. COSTA. Italiano. Molto buono. Mr. Squillace is the Director of the Natural Resources Law Center at the University of Colorado School of Law.

We have Ms. Shari Wilson, the Secretary of the Environment for the State of Maryland, and we have Mr. Dave Goss, the Executive Director of the American Coal Ash Association.

For those of you who have not testified before a committee in Congress, you have those lights right in front of you there in front of Ms. Wilson. Those timing lights are to be a guide, but we do follow them. They give you five minutes.

The green light, of course, means you are on, the yellow light means you have a minute left, and the red light means that the Chair would really appreciate very much if you would draw your comments to a close. If in fact you have more information you would like to provide us, we do ingest that in the written statements, so keep it to five minutes.

The Chair would now like to recognize with those rules laid out there the professor from the University of Colorado School of Law.

STATEMENT OF PROFESSOR MARK SQUILLACE, DIRECTOR, NATURAL RESOURCES LAW CENTER, UNIVERSITY OF COLORADO SCHOOL OF LAW

Mr. SQUILLACE. Thank you, Mr. Chairman. My name is Mark Squillace. I am the Director of the Natural Resources Law Center and a Professor of Law at the University of Colorado Law School, and, most relevant for our purposes today, I was a member of the National Research Council committee that issued a report recently on the disposal of coal combustion residues at coal mines.

It is my pleasure to appear before the Committee today to address the question that was posed by the Committee, which is how should the Federal Government address the health and environmental risks of coal combustion waste, and for reasons that I will explain in a moment I am going to use the term coal combustion residues rather than coal combustion waste when referring to these materials.

Let me take a moment, if I can, to just explain my perspective on the nature of the problem we are addressing here. As the Chairman has already noted, we produce about 125 million tons of coal combustion residues annually in this country. This is a lot of material. It is about the equivalent of what we produce in the municipal solid waste annually in this country.

To try to visualize how much material we are talking about, if you could imagine a line of railroad cars extending from New York to Los Angeles, it would go back three and a half times filled with coal combustion residues. It is a lot of material, and dealing with it poses a significant challenge. There is nobody that can question that.

The vast majority of these coal combustion residues that we are talking about are residues from air pollution control equipment that is placed at coal-fired power plants. About 60 percent is in the form of fly ash, which is the chief residue from electrostatic precipitators and bag houses at these facilities. A little more than 20 percent comes from scrubbers or flue gas desulfurization processes which are used to reduce SO2 emissions.

About 16 percent is in the form of bottom ash, which is, of course, a residue that comes and falls out of the bottom of the boiler, and, finally, a small portion is in the form of boiler slag, which comes from an older type of boiler that is generally being phased out.

As the Committee's question implies, the disposal of these CCRs can impose significant environmental risks and health risks as well. I would like to make two recommendations to the Committee on this issue.

First and foremost, I think Federal policy should treat the disposal of coal combustion residues, whether at a coal mine, a landfill or an impoundment, as the option of last resort. Second, where disposal is allowed, Federal standards should be established to ensure the disposal of CCRs does not cause environmental damage.

Before expanding on these recommendations, let me briefly explain why I am using the term coal combustion residues. The reason really is that these are not wastes. As we are going to hear I am sure from the representative from the Coal Ash Association, there are many beneficial uses for these products, and for this reason I think the term residue better reflects the nature of the materials rather than waste. Waste obviously connotes something that you dispose of or throw away. I would rather we thought about these materials as something that we can use beneficially.

Now let me turn to my two recommendations. The first concerns the beneficial reuse of these materials. The NRC committee report suggested that the use should be strongly encouraged. Currently less than half of our CCRs are in fact being beneficially used outside of the disposal process.

I would go further. I would argue that they should only be authorized for disposal in exceptional circumstances, and my reasons are quite simple. The disposal of coal combustion residues causes external costs that are not captured in the marketplace.

These include, for example, as we have already discussed, the potential environmental risks and damage associated with disposal of CCRs and, more importantly, it includes the environmental and societal costs that are associated with mining virgin materials that these coal combustion residues could replace in road construction and other kinds of purposes. These costs would include, by the way, the carbon footprint associated with these kinds of mining activities.

While disposal might still be necessary in some limited circumstances, especially in the short term, I would urge the Committee to consider some possible incentives to encourage the beneficial secondary use of CCRs. These might include, for example, a ban on disposal unless the CCR producer demonstrates a substantial and good faith effort to make reuse of the CCRs, perhaps even a modest tax on disposal that could be used to support beneficial secondary uses and, finally and most importantly perhaps, setting mandatory minimum content requirements for Federal highway construction that can be waived only in exigent kinds of circumstances.

In addition, imposing strict regulatory standards on disposal will I think provide a further incentive. As the Chairman has already noted, Wisconsin currently reuses about 85 percent of their coal

combustion residues. I don't think that is an accident. Wisconsin has one of the strictest regulatory programs for coal combustion residues in the country, and I think that directly reflects the fact that a lot of these residues are being reused.

I am out of time I see. I just want to mention that I would as well support the setting of strict standards for site characterization and CCR characterization at the mine, performance standards, bonding, monitoring and other kinds of requirements if in fact they are ultimately disposed of, and I will look forward to working with the Committee in the future on trying to develop appropriate legislative standards if the Committee decides to go forward on that line.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Squillace follows:]

Statement of Mark Squillace, Professor of Law, and Director, Natural Resources Law Center, University of Colorado School of Law

Thank you for the opportunity to appear before the Subcommittee on Energy and Mineral Resources of the House Committee on Natural Resources. The subcommittee has called this hearing to address the question: "How Should the Federal Government Address the Health and Environmental Risks of Coal Combustion Waste?" Implicit in this question is the concern that coal combustion wastes may contain toxic constituents that pose long-term damage to water supplies and the resources that depend on them.

I have spent most of my professional career working on mining issues, with a particular emphasis on coal mining. I was also a member of the National Research Council (NRC) Committee that was called upon recently to study the disposal of coal combustion residues (CCRs) in coal mines as part of the mine reclamation process. That effort was especially relevant to the question posed by the Committee.

I have two recommendations that respond to the question posed by the subcommittee. First and foremost, federal policy should treat the disposal of coal combustion residues—whether in coal mines, impoundments or landfills—as the option of last resort. Whenever possible, CCRs should be used for secondary beneficial purposes, and such use should be promoted through incentives for secondary use as well as disincentives for disposal. The NRC Committee recommended that secondary use of CCRs be "strongly encouraged." I would go further and argue that disposal of CCRs in coal mines, landfills, and impoundments should not be authorized unless and until the producer demonstrates a substantial and good faith effort to make the CCRs available for secondary use.

In establishing a presumption in favor of secondary use, it will become important to be clear that disposal of CCRs in a coal mine, in an impoundment, or in a landfill does not qualify. While it may be true in some cases that CCRs can neutralize toxic materials at a disposal site, this fact alone should not be used to justify a beneficial secondary use claim. Beneficial, secondary uses must be new uses of the CCRs that allow the user to avoid the use of some other substitute material. Second, where disposal is allowed, federal standards should be established to ensure that the disposal of CCRs does not cause environmental damage.

Before expanding on these recommendations, let me raise an issue about nomenclature. At the outset, federal policy should avoid accepting the characterization of coal combustion residues as "waste" materials. Calling them wastes suggests that they are something for disposal. In fact, most of these wastes have high values for other purposes. I have used the term "residues" which was the term settled on by the National Research Council Committee on which I served. The Office of Surface Mining has used the term "by-products," and the EPA, simply "products." Whatever term is used, it is important that federal policy recognizes that, for the most part, they are not wastes and that disposal of these materials in mines, impoundments and landfills should be discouraged.

Federal Policy Should Discourage Disposal

CCRs come from various sources at coal-fired power plants. The majority—about 57 percent—comes from fly ash, which is the chief residue from burning finely crushed coal, and which is collected in baghouses and from electrostatic precipitators. Flue gas desulfurization (FGD) material is a residue from the wet and dry scrubbers typically used for reducing SO2 emissions. FGD materials comprise

about 24 percent of the CCRs produced at these plants. Bottom ash is a coarser residue that falls out of the boiler and makes up about 16 percent of CCRs. Finally, boiler slag is a molten form of bottom ash that comes from certain types of furnaces. Boiler slag particles have a smooth, granular surface that are uniform in size. About 3 percent of CCRs are in the form of boiler slag.

CCRs are widely recognized as suitable for a range of beneficial uses. For example, fly ash has cementitious properties that can be used in the production of cement and other construction activities, and is also suitable for use in the production of cement, especially in lightweight concrete products. FGD materials are essentially gypsum (calcium sulfates and sulfites), which is the principle material in the manufacture of wallboard. FGD materials are also used in the production of cement.

Much is being done to promote the secondary use of these and other CCRs. The Coal Combustion Products Partnership (C2P2) program, which is a cooperative effort that includes the U.S. Environmental Protection Agency (EPA), the American Coal Ash Association, (ACAA), the Utility Solid Waste Activities Group (USWAG), the U.S. Department of Energy (DOE), the Federal Highway Administration (FHWA), and the U.S. Department of Agriculture (USDA), does a good job of promoting the Secondary use of coal combustion residues in beneficial applications. See: http://www.epa.gov/epaoswer/osw/conserve/c2p2/index.htm

The most recent statistics show increasing use of CCRs for beneficial purposes, but much more can still be done. For example, the ACAA estimates that almost 45 percent of the 72.4 million tons of fly ash produced in 2006 (about 32,423,569 tons) was used in 12 of 15 applications that they tracked. This was a 5 percent increase over the previous year. FGD gypsum production in 2006 was about 12.1 million tons, and of that about 79 percent (or 9,561,489 tons) was used, primarily on the production of wallboard and similar products. This is up 2.5 percent over that of 2005. Bottom ash production was about 18.6 million tons of which 45 percent (or about 8,378,494 tons) was used. This was up 4.5 percent from that of 2005. About 2 million tons of boiler slag was produced in 2006 of which 83 percent (or 1,690,999 tons) was used. This was down from the estimated usage of 96.6 percent in 2005. Boiler slag is used primarily in blasting grit and as roofing granules. Because boiler slag comes from older style cyclone furnaces, boiler slag production is expected to decline as these furnaces are retired.

While the economic incentives for secondary use of CCRs are generally strong, there remains a great deal of CCR disposal that would not likely occur if the true cost of disposal were factored into such decisions. Among the external costs that are unaccounted for in CCR disposal are the societal and economic costs of mining virgin materials, including the carbon footprint from such activities, and the environmental costs and associated risks that result from CCR disposal. While a complete accounting of these costs should be made, these external costs are sufficiently obvious to warrant the immediate imposition of incentives for secondary use and disincentives for disposal of CCRs. This might, for example, include a modest tax on CCR disposal, the proceeds from which could be used to promote secondary use of CCRs. A $0.10/ton tax on the nearly 53 million tons of CCRs that were disposed of in 2006 would yield revenues of $5.3 million, and this money could be used to help establish markets for CCRs or to otherwise incent CCR producers to make secondary use of these materials.

In addition, and as suggested previously, federal and state policies and laws should encourage beneficial secondary use of CCRs by demanding that CCR producers demonstrate a substantial and good faith effort to make the CCRs available for secondary use. This should include an analysis of the suitability of the particular CCRs that are being produced for secondary uses, the relevant markets that might exist for those CCRs, and the efforts that have been made to market those CCRs to interested parties. Federal and state policy could promote these markets by establishing minimum CCR content (or CCR preference standards) for road building materials in Federal Aid Highway projects.

Even as secondary use is encouraged, some CCR disposal will certainly continue, especially in the short term. Because CCRs may contain toxic constituents, the NRC Committee concluded that enforceable federal standards should be established when CCRs are disposed of in coal mines. Logically, the need for such standards applies to CCR disposal in impoundments and landfills as well. The establishment and implementation of these standards is important not only to protect the environment and public health, but also because strict standards will themselves promote the beneficial secondary use of CCRs. Notably, in Wisconsin, which has one of the best programs in the country for managing CCR disposal, 85 percent of CCRs were beneficially used in 2004 as compared with only 35 percent nationally. Coal Combustion Waste Management at Landfill sand Surface Impoundments, 1194-2004, DOE/PI-0004 (April, 2006)

Among the issues to be resolved regarding federal CCR disposal standards are the questions of which federal agencies should be primarily responsible for managing CCRs, and what standards should be imposed. Once again, the NRC Committee lays out a useful roadmap for answering these questions. The EPA is the federal agency most closely associated with managing waste disposal so it makes sense that the EPA will be significantly involved in this process. Nonetheless, the NRC Committee was focused on CCR disposal at coal mines during the reclamation process, and coal mining reclamation is under the jurisdiction of the federal Office of Surface Mining. Given these overlapping roles, the NRC Committee wisely recognized that coordination between the Office of Surface Mining and the EPA was needed. The Office of Surface Mining will not be involved in CCR disposal in impoundments and landfills, but it makes good sense that mine disposal standards would be consistent with standards for impoundments and landfills. Thus, it is critically important that the EPA be closely involved with the Office of Surface Mining in developing standards for CCR disposal in mines, and that EPA use those standards as a template for federal standards for impoundments and landfills, if Congress grants EPA the authority to promulgate such standards.

As for regulatory standards, the NRC Committee lays out a sensible outline for such standards. Drawing on the Committee's recommendation, Congress should pass appropriate legislation to enforce that the following standards should be implemented at all landfills, impoundments, and mines that are subject to CCR disposal:

1. CCR and Site Characterization. Both the disposal site and the CCR materials must be assessed and characterized to determine their potential for promoting leaching of toxic materials on their own and once they are combined at the site.
2. Site-Specific Management Plans and Performance Standards. A specific plan must be developed for the disposal at the particular site, and site-specific standards must be established that assure the protection of the environment and public health. Generally, sites should be designed to minimize the flow of water through CCRs so as to minimize the potential for leaching toxic materials.
3. Monitoring and Bonding. Given the uncertainties and risks associated with CCR disposal, the placement of a suitable number of monitoring wells should be required with special attention to wells that are down-gradient from the CCR disposal area. An adequate bond or other financial assurance should also be required to assure that the regulatory agency can cover the costs of remedial action, should such action become necessary.
4. Public Participation. The public has a strong interest in assuring the disposal of CCRs does not adversely affect the environment or public health. Thus, any CCR disposal proposal should be explicitly made subject to an environmental assessment process with the opportunity for robust engagement of the public on issues of concern.

While much of what I have recommended to the committee can be accomplished without legislation, legislative direction could be very helpful in clarifying federal policy and especially in promoting the beneficial secondary use of CCRs. For this reason, I look forward to an ongoing dialogue with the Committee and its staff as it considers whether legislative action may be necessary or appropriate.

Thank you for opportunity to present these views to the Committee. I welcome your comments and questions.

Mr. COSTA. Thank you, and we will pursue some of your comments at the question and answer period.

Our next witness is Ms. Shari Wilson, Secretary of the Environment for the State of Maryland, our neighbor next door.

STATEMENT OF SHARI WILSON, SECRETARY, MARYLAND DEPARTMENT OF THE ENVIRONMENT

Ms. WILSON. Good morning, Chairman Costa and Honorable Members of the Committee. Thank you for the opportunity to share in particular Maryland's experience with coal combustion waste and, more importantly, for your interest in this very important issue.

I also want to thank Congressman Sarbanes for his immediate support and keen interest in this issue as it relates to public health

for the citizens of Maryland. We have greatly appreciated his support.

This morning I would like to talk about four items: The generation of coal combustion wastes in Maryland, how it is regulated, what our experience has been, and our recommendations for moving forward.

In Maryland we, too, rely on coal for over half of our electricity generated. We have five companies in Maryland who generate coal combustion byproducts at nine facilities. Those nine facilities produce approximately two million tons of coal ash—that is fly and bottom ash—each year.

We do anticipate that the volume of the material generated will increase significantly over the coming year. In Maryland, the Maryland Healthy Air Act requires reduction of sulfur dioxide by 80 percent by 2010 and 85 percent by 2013. Flue gas desulfurization equipment or scrubbers, as the professor mentioned, is the technology that will be used to achieve those reductions.

While removing 200,000 tons of SO2 emissions, at the same time use of those scrubbers will also increase the volume of scrubber slug by 2.5 million tons, so we will be more than doubling the tonnage of this waste material that is generated in Maryland over the coming five years.

As you mentioned, coal combustion byproducts are frequently reused. Currently in Maryland we are at about the one million ton mark, so we are just around 50 percent. Fly ash, as you all know, can be reused for many beneficial purposes, including concrete manufacturing and building material, and wherever possible reuse must be strongly encouraged.

There are, however, questions about the conditions under which reuse is and should be taken. For example, when used for structural fill should liners be used? Should there be defined distances between the use of the material and potable water resources? Should it be used in sensitive environmental areas, wetlands and other areas of special state concern?

So while reuse is the goal and we would like to reach the 100 percent mark in the preferred alternative, currently in Maryland half of our waste is not reused, and we have many questions about further guidelines for the proper reuse.

The remainder of the material generated in Maryland is disposed of or used in mine reclamation. We have 29 locations where these materials have been disposed or are being used in one form of mine reclamation or another. Of those sites, 21—21 of the 29—are surface mines, 20 are coal-related and one is a sand and gravel mine. Eight are structural or fill sites. So we are a small state, but we have a variety of conditions under which these materials are used and then disposed of.

As far as our regulatory authority is concerned, in Maryland regulatory controls exist through mining and/or water discharge permitting authority, so we are using our mining authority and our water discharge permit authority to control mine reclamation and disposal sites. We do not have regulations that are specific to the management and control of coal combustion waste products. Many states also use their solid waste authority. Maryland does not, but we have proposed to do so.

Turning quickly to our experience, at two sites within the past year we have experienced groundwater and surface water contamination issues as the Congressman from Maryland mentioned. One site impacted residential groundwater wells. We took immediate action to correct, require remediation, corrective action, connection of those homes to public water supply and impose the third largest fine in Maryland's environmental civil penalty history, again indicating the severity of the situation. We have one other enforcement action underway.

Also at around the same time we began to assess comprehensively what we are doing to regulate these materials in Maryland. We in eight months have put in place a proposal to more tightly regulate using our solid waste authority as many other states do to more tightly regulate how this material is disposed of.

Turning to our recommendations, we have three. There is an opportunity for further research at the Federal level with regard to health impacts and also with regard to guidance on beneficial reuse and the circumstances under which that is appropriate.

Also with regard to Federal regulation, while we do not see any reason why this material should be regulated as a hazardous waste, we do see this as an issue where there is a need for some Federal threshold or baseline of regulation to ensure public health is protected.

I have to mention that this is an area where the conditions from state to state vary tremendously. Even within the small geographical area within Maryland we have tremendous variety in our groundwater conditions, our soil conditions, and the guidelines for proper and safe disposal will vary tremendously from location to location.

This is the same across the country, of course, but magnified many times over. So while we think there is a place for a Federal baseline or threshold of action, a threshold which states must meet, it is very important to understand in this arena that the conditions significantly vary in terms of geological conditions, groundwater conditions and temperature and climate and a lot of other issues that affect proper disposal.

So to the extent there were to be any Federal action, we believe that it would be appropriate to set a minimum threshold but allow states to exceed those thresholds, but also to tailor the regulatory scheme to their particular conditions.

I also want to note that the ECOS Waste Subcommittee has recently sent a letter to EPA expressing the opinion that the materials should not be regulated as a hazardous waste and that no Federal regulation appears to be warranted, and I understand that ECOS as a body may take up this issue in the fall.

Maryland's position is slightly different than that. We agree that there is no call for regulation of the material as a hazardous waste, but we do think that some Federal threshold would assist in ensuring that the states have programs in place to protect public health and the environment based on their individual conditions.

Mr. COSTA. You have exceeded your time by two minutes and 30 seconds. I have been patient. I want to be fair to all the witnesses.

Ms. WILSON. I understand, Mr. Chairman, and I am concluding. I greatly appreciate your patience.

[The prepared statement of Ms. Wilson follows:]

Statement of Shari T. Wilson, Secretary,
Maryland Department of the Environment

Chairman Costa, and honorable members of the Committee, thank you for the opportunity to share Maryland's experience with coal combustion waste with you and, more importantly, for your interest in this very important issue.

We also greatly appreciate Congressman Sarbanes' interest and attention to issues surrounding the disposal of this by-product of producing energy from coal.

In 2006, the most recent year for which complete information is available from Maryland's Public Service Commission, coal generated 60.1% of the electricity generated in the State. In Maryland, there are five companies who generate coal combustion by-products at 9 facilities. Approximately 2 million tons of coal ash (fly and bottom ash) is generated annually from Maryland plants. Of that 2 million tons, approximately 1.6 million tons of coal ash is from the plants owned and operated by two companies, Constellation and Mirant.

In Maryland, the Maryland Healthy Air Act requires flue gas desulfurization equipment (known as "scrubbers") to be put in place by 2010 to reduce sulphur dioxide (SO2) emissions by 80%. A second phase of requirements in 2013 will increase the emission reductions to 85%. That equipment, while reducing SO2 emissions by over 200,000 tons will also increase the volume of scrubber sludge produced by 2.5 million tons. By 2013, therefore, facilities in Maryland will generate 4.5 million tons of CCWs.

As you are aware, coal combustion by-products are frequently reused. Currently, approximately 1 million tons, or one half of the coal ash produced annually, is beneficially used in Maryland. Fly ash can be reused for concrete manufacturing and in building material. It can also be used as structural fill in roadway embankments and development projects. (It can also be used in agricultural applications. While these are just a few of the reuse applications, there are many outstanding questions with regard to the safety of reuse.) For example, when used for structural fill, should liners be used; should there be defined distances between use of CCWs and potable water sources; should it be prohibited in shoreline areas such as the Chesapeake Bay Critical Area, source water protection areas, wetlands, or other areas of special concern; if used in agriculture, should it be applied to crops that are for human consumption. These are issues being examined as the State begins to develop a second phase of regulations to more effectively control reuse.

While reuse is the goal and preferred alternative, currently in Maryland, approximately half of the coal combustion by-products generated in Maryland are disposed of or used in mine reclamation. Maryland has 29 locations where these materials are disposed of or used in mine reclamation.

Currently, in Maryland, regulatory controls exit through mining and/or water discharge permitting authority, but the State currently does not have regulations that are specific to the management and control of CCWs.

At two of the disposal sites, within the past year, the Department of Environment has taken legal action to require cleanup of groundwater or surface water contamination. This contamination results from the placement of 4 million tons at one site and 5.5 million cu/yrds at a second site. The groundwater contamination at one site affected residential drinking water wells. As a result, the Department required groundwater remediation, provision of a temporary water supply and eventually a connection for residences to a public water supply. The severity of the situation resulted in the third largest civil environmental penalty in state history, a fine of $1 million.

Prior to that action, the Department began to assess how it regulated the disposal of this material. We were concerned that the regulatory controls Maryland was using needed to be improved given the range of disposal sites and the varying geology and subsurface conditions in Maryland.

At that time in 2007, we were aware that the Environmental Protection Agency (EPA) had been working on regulations since 2000 to institute additional controls on the management of CCWs but had not finalized a proposal. The lack of any federal standard combined with the immediate need to better control disposal prompted Maryland to develop new regulations to strengthen controls on the management and disposal of CCWs. In a very short timeframe, within 8 months, Maryland proposed regulations for public review and comment at the end of 2007 and announced our intent to develop a second set of regulations dealing with the beneficial reuse of CCWs this year. At least two local governments in Maryland have also begun considering the extent to which they should institute, through their land use planning and zoning authority, additional controls.

Developing and implementing regulations such as these also present a new expense for the State. To address that issue, during the legislative session of the Maryland General Assembly, the Department proposed legislation to establish a fee to be paid by a generator of coal CCWs based on a per ton rate of CCWs generated annually excluding CCW that was beneficially reused. While the legislation was not enacted, there was general recognition of the need for the regulations and the need to pay for implementation. The Maryland Department of Environment continues to aggressively work on this important issue using the State resources available to us.

While, we do not believe it is necessary or appropriate to regulate this material as a hazardous waste, clearly, there is a need for more stringent management and control of CCWs in order to protect human health and the environment in Maryland.

We believe there is also a need for action at the federal level. First, a basic premise of the RCRA statute is to promote reuse. There are many opportunities for the federal government, through research, to more effectively assess reuse opportunities and, as a result, to significantly reduce the volume of material that must be disposed. Alternatives to disposal must be maximized to the greatest extent possible.

Second, we believe that the federal government should establish a minimum set of standards for land disposal such as requiring landfill type liners at non-mining reclamation sites as Maryland proposes to do. We are aware that other States, not just Maryland, are dealing with ground and surface water contamination issues from disposal. This is also an area where a threshold of consistency from state to state would be beneficial.

It is, however, critical to note, that with this issue a one size fits all approach will not work. It will not work due to the many variables that control safe disposal such as geology and groundwater characteristics. Each state must be able to tailor standards based on the type of ash generated, the characteristics of that ash, the land disposal methods used, the geology and groundwater conditions and many other characteristics that affect whether disposal is protective of public health.

Thank you for taking the initiative to inquire into this important issue and for the opportunity to share Maryland's perspective.

Mr. COSTA. All right. Our next witness is Mr. David Goss, the Executive Director of the American Coal Ash Association.

Mr. Goss, I would suggest that you not follow the two previous witnesses as an example on the time that I am going to give you.

Mr. GOSS. I will try, Mr. Chairman. Thank you.

Mr. COSTA. Thank you.

STATEMENT OF DAVID GOSS, EXECUTIVE DIRECTOR, AMERICAN COAL ASH ASSOCIATION

Mr. GOSS. Mr. Chairman and Members of the Committee and distinguished panelists, I appreciate the opportunity to be here this morning.

Our organization promotes the management and beneficial use of coal combustion products, a term that we prefer to use, which include fly ash, bottom ash, boiler slag and air emission control residues such as synthetic gypsum.

It is our opinion that the EPA regulatory determination made in 1993 and reaffirmed in 2000 is still correct that CCPs do not warrant regulation as hazardous waste. Furthermore, current state regulatory initiatives are more than sufficient to protect the health and safety of the public and the nation's environment. This view is reflected, as Ms. Wilson mentioned, in the ECOS letter on June 5, and it was mirrored in an Oklahoma Department of Environmental Quality letter to Congress on June 6.

CCPs have varied applications, ranging from replacing Portland cement and concrete, which reduces CO_2 emissions, to being utilized in road construction, agricultural use, wallboard manufac-

turing, soil amendments and many other applications. In most cases, the use of these materials is technically equivalent or superior to other products.

For example, fly ash, when used as a replacement for Portland cement, is not just a filler or a substitute, it actually improves the concrete, makes it more durable and longer lasting than using Portland cement alone.

This type of sustainable model for the use of CCPs, which is done in an environmental, health and safety conscious manner, should be a desire of all of us in this room, I believe. The reason why beneficial use should be supported is simple: Using CCP avoids using other materials and reduces the need for additional disposal facilities.

If this nation is going to develop a sustainable energy policy and a society where the use and reuse of many of our industrial byproducts and waste streams is promoted, similar to what they do in Europe today, then we must begin now to conserve our nation's resources for her future generations.

The Federal Government has been involved in CCP utilization as part of the regulatory and legislative initiative for many, many years. For nearly three decades, extensive research has been conducted and technical guidance developed to ensure the environment is protected while recycling millions of tons of these mineral resources each year.

State specific regulation is best able to address local conditions. Because of the wide variations of climates, topography and soils across the United States, it is necessary that each state evaluate its own need when using industrial byproducts in construction or reclamation activities. What may work in Colorado may not work in Maryland or Pennsylvania.

State regulations are crafted to accommodate local environmental conditions. These mature regulatory programs and policies developed and implemented by the states provide for the proper management of CCPs. Federal regulations would not be able to cover each of the conceivable scenarios.

As you know, the Office of Surface Mining, in consultation with the EPA, is developing regulations to implement recommendations made by the National Research Council to address mine placement of CCPs. These broad based rules will enable states to update or develop rules needed to address their own needs within the framework of the national program.

If an adverse condition is identified, we have seen that states prepare to respond. Despite the occasional example such as in Anne Arundel County, we believe the relatively few exceptions do not require new Federal regulations. Rather, the state regulatory process is working well. Maryland intervened. The operation ceased. Corrective action was initiated, and penalties were imposed. Maryland didn't need Federal regulations to address this issue.

A goal of this Committee, I believe, is to help balance our nation's demand for energy with our rapidly shrinking natural resources. CCPs can and should be a part of that effort to conserve natural resources because if we don't use the CCPs themselves

then earth, clays, aggregates, soils or more greenhouse gases will otherwise be extracted, processed, used or emitted.

We agree with the National Research Council's findings that an integrative process of characterization, management and engineering design can best reduce potential environmental risks whether it is in mining, road construction or other land uses.

Additional legislative action isn't warranted or needed and could actually inhibit reuse and recycling. We must better manage our limited natural resources by using and recycling these existing industrial mineral resources, including CCPs.

Thank you, sir.

[The prepared statement of Mr. Goss follows:]

Statement of David Goss, Executive Director, American Coal Ash Association

Good morning, Mr. Chairman. My name is David Goss, Executive Director of the American Coal Ash Association. I sincerely appreciate the opportunity to address you, the members of the Committee and other distinguished experts appearing before you on this important topic. ACAA is an industry association of producers, marketers, end-users, researchers and others who support the beneficial use of what our industry refers to as coal combustion products, commonly known as CCPs. This includes coal ash and residues from air emission control systems such as synthetic gypsum products. These materials are the residuals from the burning of coal to generate electricity. By the very nature of the energy generation process utilizing coal, these byproducts cannot be eliminated entirely and must be managed like many other industrial byproduct streams. We consider CCPs to be mineral resources that if not used, become resources that are wasted.

In a perfect world, energy generation would not have any byproducts because the process would efficiently use all of the raw materials needed to generate electricity. Yet, the coal fueled generation process is not perfect. Even other energy options have consequential impacts, for example wind, which yields noise pollution and bird impingement. The coal-based energy generation industry generates byproducts including fly ash, bottom ash, slag and gypsum. The difference is that many of our products can replace or improve other commonly used commodities including portland cement and constituents which are used to produce concrete and other construction materials. The safe re-use of CCPs has a significant positive impact on this nation's mineral resources, its environment and economy. It is essential to promote and support activities that contribute to a more sustainable nation. By sustainable nation, I mean efficient, socially responsible and environmentally friendly usage of CCPs. I think the majority of us would agree that byproduct re-use which is environmental, health and safety conscience is much better than putting wastes in a disposal facility. Recognizing this common interest to promote safe and environmentally sound byproducts use, I am here to address how the beneficial use of CCPs contributes measurably to reduce environmental impact and is properly being regulated by the federal and state authorities.

Background Information

Annually, more than 125 million tons of CCPs are produced and more than 54 million tons (or 43%) are used beneficially. These beneficial uses include: raw feedstock for portland cement production...as a replacement for portland cement in concrete and concrete products...as mineral filler in asphalt...as aggregates in road construction...for soil modification and stabilization...for wallboard panel products...in agriculture...in coal mine reclamation and many other commonly accepted uses.

The premise of this hearing is what should be done by the federal government to regulate CCPs. I believe that the federal government has for years worked closely with states to address the impact of CCPs in all media: water, land and air. I am taking the liberty of highlighting only a few of more recent federal efforts. Our industry believes this partnership between federal and state authorities has allowed state governments to remain agile to address unique issues related to local topography, climatology and land conditions (including abandoned mine lands). We do not see a need for this regulatory balance to be legislatively adjusted at this time.

On May 22, 2000, the United States Environmental Protection Agency ("EPA") confirmed in the Federal Register that regulation of CCPs under Subtitle C of the Resource Conservation and Recovery Act, ("RCRA") was not warranted. Further-

more, the EPA stated "we do not want to place any unnecessary barriers on the beneficial uses of these wastes, because they conserve natural resources, reduce disposal costs and reduce the total amount of waste destined for disposal." The EPA also stated, "We have not identified any other beneficial uses that are likely to present significant risks to human health or the environment and no documented cases of damage to human health or the environment have been identified." (See 65 Fed. Reg. 32214 to 32228, May 22, 2000).

In 2004, the United States Department of Energy ("DOE") and EPA issued a detailed evaluation of the placement of CCPs in landfills and surface impoundments, for the period 1994 through 2004. This study was done to provide additional information not available during the regulatory determination process that supported the position taken by the EPA on May 22, 2000 cited above. The report concluded that the information reviewed showed improved management of CCPs was seen in both landfills and surface impoundments. Additionally, 100% of the sites reviewed were covered by one or more state issued permits.

During 2004 and 2005, the National Research Council of the National Academies conducted an extensive evaluation of the use of CCPs in mining activities, the results of which were published in 2006. The committee concluded that the use of CCPs as part of mine reclamation is appropriate provided that an integrated process of characterization, management and engineering design is in place to reduce potential risks. Because of this conclusion and the other recommendations by the committee, the Office of Surface Mining ("OSM"), in consultation with the EPA, is taking the lead role in developing proposed rulemaking. The OSM rules would pertain to permit applications and performance standards for coal mine reclamation under Title V of the Surface Mining Control and Reclamation Act of 1977 ("SMCRA" or the "Act") or in the reclamation of abandoned coal mine sites funded under Title IV of the Act. This rulemaking is anticipated to be issued in the summer of 2008.

Beneficial Use

Mr. Chairman, it is our opinion that the current state and federal regulatory process is more than adequate to protect both the environment and to address any potential health risks to the general public. Recently there was a situation in Anne Arundel County, Maryland where the placement of CCPs (at the Gambrill's site) was found to be impacting local groundwater. As a result of that incident, the State of Maryland immediately intervened,, operations were halted and worked with the company involved and the local community to correct the situation. Furthermore, the Maryland Department of the Environment ("MDE") has instituted a full review of their solid waste and beneficial use regulations as they pertain to CCPs. The lessons learned at this one site are being shared with surrounding states and with other states through the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and EPA regional offices to understand the specific situation at this location. This unusual situation, in our opinion, does not warrant broad federal regulations.

The Commonwealth of Virginia has just formed a Technical Review Committee to assess the adequacy of the State's current CCP regulations along with a broader review of Virginia solid waste regulations. The first meeting of this broad based advisory group is scheduled for later this week. This regulatory review process will identify any situations or scenarios where changes to Virginia regulations might be needed.

It is our opinion that most states want to continue their role in the oversight of management, recycling and beneficial use of CCPs and other industrial byproduct streams. Routinely conducted for many years, industrial recycling of materials continues to play an important role.

Gambrill's is, we think, an isolated example related to one CCP situation. As discussed above, other surrounding states are looking at these circumstances to ensure any lessons learned are instituted to protect their citizens and environment. In 2006, more than 54 million tons of CCPs were used in fifteen application categories. These include use in concrete and concrete products; the production of portland cement; flowable fill materials; structural fills and embankments; road base and soil modifications; mining, agricultural and other construction activities. These applications have enabled contractors, end-users and project owners to reduce the consumption of raw materials, helped reduce greenhouse gas emissions and have eliminated the need for new landfill or impoundment space.

Our Association believes that using CCPs in these numerous proven applications is not "disposal." CCP re-use alternatives have been demonstrated by analysis, research, testing and successful construction and remediation activities. For example, it is a measurable benefit that using fly ash in concrete as a partial replacement for portland cement can decrease CO_2 emissions and improves performance,

strength and durability of the concrete. CCPs do not just replace the portland cement, they improve the product. Increasing the longevity of structures by using fly ash, for example, reduces the need for replacement or re-construction of this nation's transportation and building infrastructures. This exemplifies how beneficial use today can better provide for future generations.

CCPs are also used extensively in coal mine reclamation to help achieve approximate original contour requirements, to eliminate dangerous high walls, as a soil amendment, to neutralize harmful acid mine drainage and for many other beneficial uses. The EPA has evaluated CCPs extensively in the last three decades and continues to affirm they are not hazardous to the public or to the environment when properly managed and used. In the May 22, 2000 regulatory determination, the EPA stated, "There have been no proven damage cases related to post-SMCRA placement of CCPs in coal mines."

For use in mining, the OSM, ASTM, DOE and a number of universities have provided technical guidance and have supported research and demonstration projects that have proven that when properly managed and placed, the beneficial use of CCPs can significantly improve conditions at active and abandoned mining sites. The DOE funded Combustion By-Products Recycling Consortium ("CBRC") has issued a number of project reports concerning the use of CCPs in mining and other applications that demonstrate their safe and effective use.

The State of Pennsylvania has documented many cases where the use of CCPs has significantly improved abandoned mine sites within the Commonwealth. Pennsylvania's positive experience with CCPs is fully described in its 2004 publication "Coal Ash Beneficial use in Mine Reclamation and Mine Drainage Remediation in Pennsylvania.

There are a significant number of industry-developed comprehensive technical standards for CCP use that address engineering properties, testing procedures and design considerations (including geological, hydrological and construction techniques). Included in this design process is specific guidance about minimizing environmental impacts such as fugitive dust, groundwater impact and storm water runoff. These documents and specifications detail protections to the environment and the public, as well as specifying quality, technical performance and other criteria. For example, the American Society for Testing and Materials International ("ASTM") has developed several standard and guideline documents that provide technical information on the use of CCPs in structural fills, embankments and mining activities. Additionally, there are many other similar technical documents issued by ASTM, American Concrete Institute ("ACI") and the American Association of State Highway and Transportation Officials ("AASHTO") that address the use of CCPs in road construction, architectural uses, as aggregates, in soil applications and in concrete products.

Furthermore, the Federal Highway Administration ("FHWA"), the DOE, the EPA, the Electric Power Research Institute ("EPRI"), the Recycled Materials Resource Center ("RMRC"), the Turner-Fairbank Technical Center and AASHTO have supported research, conducted studies, provided training and issued technical guidance covering the use of these same CCPs in highway construction, road work and land applications. For example, years of monitoring of highway and road construction projects across the nation have seen no health or safety issues resulting from the use of CCPs. In a study by the RMRC at the University of New Hampshire, it was concluded that:

> Studies and research conducted or supported by EPRI, government agencies, and universities indicate that the beneficial uses of coal combustion products in highway construction have not been shown to present significant risks to human health or the environment.

The practice of using sound management techniques and evaluating the specific project conditions is implemented widely. EPRI, ASTM, ACI, FHWA and state agencies have guidance documents that provide technical and environmental considerations to engineers, contractors and highway authorities on the use of CCPs in highway and road construction and land reclamation. Federal and state agencies routinely approve CCPs for use in road construction because there are well established technical practices that address potential CCP impact on the environment. Some states further define the use of CCPs under their own codes and regulations, further substantiating the beneficial value that CCPs can offer. Other states may not approve all CCPs for use for road construction but welcome the use of fly ash, for example, as a partial replacement for portland cement. These geographic distinctions are worthy of note because they mirror the natural and economic climates and differences that face different states or regions.

In 2003, the EPA, DOE, FHWA and the CCP industry formed the Coal Combustion Products Partnership ("C2P2"). This is a nation-wide effort under the Resource

Conservation Challenge to help promote the beneficial use of coal combustion products and the environmental benefits that result from their use. The partnership has established a goal of 50% utilization of CCPs by the year 2011, a goal that was mutually agreed upon by the EPA, industry, DOE, the Utility Solid Waste Activities Group ("USWAG") and FHWA. The partnership is fully described at the EPA website http://www.epa.gov/epaoswer/osw/conserve/c2p2/index.htm. This website provides technical and environmental information about using CCPs in ways that conserve natural resources, reduce the need for landfills or disposal facilities and that can reduce greenhouse gas emissions. Case studies and documents describing CCP applications are available to interested parties. C2P2 partners include producers, marketers, state agencies, end-users and researchers whose experiences with CCPs further demonstrate the value that these materials can offer.

Conclusions

We need to use fewer natural resources and use more industrial byproducts to improve our society and sustainable economy. As President Carter stated, "We simply must balance our demand for energy with our rapidly shrinking resources." Naturally, the use of any byproduct must be done in a socially responsible manner that addresses environmental, health and safety needs. We believe that the current federal and state regulatory schemes are well suited to address CCPs use and management.

Regulations affecting air, water and solid waste all have an impact upon industrial practices and resulting byproducts. Air quality requirements are primarily driven or controlled at a federal level. Water and solid waste regulations have been developed at the national and state level since many studies have recognized that risks are not the same all across the country and impacts are better governed at a local level to address specific geological, hydrological or climate conditions.

As described above, key federal agencies including the EPA, the DOE, the FHWA, the OSM, the U.S. Department of Agriculture and along with many states have funded, supported and promoted many beneficial uses for CCPs. Extensively documented research and field projects reinforce our position and theirs that using CCPs is both technically and environmentally sound and provides greater benefit to the environment than disposal.

ACAA and the CCP industry believe that current federal and state regulations are protective of the environment and public health. Most states have developed regulatory guidelines for management and beneficial use for CCPs, which have implemented practical and technically sound methods for managing these materials. When a negative example is found, states intervene and share their experiences through ASTSWMO, EPA regional offices and technology transfer activities that support each state's unique needs. Additional legislative or broad brush regulatory schemes aren't warranted to address an isolated instance.

Years of actual field experience have shown that the benefits of using CCPs in lieu of other materials have not had a negative impact on the environment, public health or safety. Engineering and environmental professionals within private sector, federal and state agencies acknowledge and support the many values of using CCPs.

As your website so clearly states, this nation needs to maintain a healthy balance between providing for energy needs and conserving our nation's precious natural resources. One way which has proven effective is to safely use industrial byproducts such as CCPs. Existing programs and regulations may need to be occasionally adjusted at a federal or state level but wholesale prohibitions on certain re-use applications or new federal regulatory schemes are unwarranted. Existing technical and environmental controls are already available to state and federal agencies to ensure that CCPs will continue to be properly used. The use of CCPs (in conjunction with good engineering judgment and the need to conserve natural resources) can provide many benefits to the public without environmental risk while promoting sustainable construction and infrastructures.

Thank you again for this opportunity to address this committee.

Mr. COSTA. Thank you very much, Mr. Goss, for staying within the time limits. You had 13 seconds left.

The time now is to the area of questioning. Let me begin with my five minutes. We prescribe to the same rules we apply to you in a sense of fairness.

Mr. Goss, you spoke about in your testimony the nature of requiring the value and the recycling. In California, Caltrans, our

state transportation agency, for example, requires 25 percent I believe of the coal ash to be used in road construction, and state highways.

What is the value? I mean, I am trying to get a sense of this. In Wisconsin they recycle, as we stated earlier, 85 percent, and you talked about other value products. I am trying to get a sense of what the value is so why we have such unevenness in terms of the applicability of reusing the coal ash.

Mr. GOSS. Well, sir, your example in California is a very good one. California is actually basing some of its requirements on the need to reduce greenhouse gas emissions.

If you use fly ash in concrete, that means you don't have to produce Portland cement, which means that Portland cement then would not be releasing CO_2 to the atmosphere. That is one of the consequences from kind of an environmental viewpoint.

But the use of these materials in concrete, for example, actually strengthen and improve their performance, making them longer lasting structures. That means less cost over the life cycle of the highway or the building or whatever.

Mr. COSTA. Yes, but if I do a bid with Caltrans and I get the bid—I have measured out all my cost inputs to build the road for 10 miles or whatever I have gotten the contract for—what is the cost to purchase coal ash to mix it in with this product, I mean, compared to other alternatives?

Mr. GOSS. Well, as compared to Portland cement, sir, the price of fly ash is typically less by either a half to two-thirds.

It may be higher in California because you are a bit of a unique state with a higher demand level, but there is an economic advantage. The cost of pouring the concrete is actually reduced by using cold fly ash in the concrete.

Mr. COSTA. All right. Madam Secretary, the comments you made, and I also want to go to Mr. Squillace on this point.

As a former state legislator, I am always very sensitive to the issue of Federalism and what the appropriate balance ought to be in the regulatory environment, and I really think one of the unique and I view it as a value added sense of America is that with state/Federal relations one size doesn't fit all, and what works for Maryland may not work in California or other states.

It sounded like in your testimony you were discussing how Maryland has successfully begun to address this issue of coal ash, but in terms of the Federal response you wouldn't be suggesting that the Environmental Protection Agency in fact have a set of prescriptive rules that would rule states' flexibility, would you?

Ms. WILSON. No, we would not, and this is the delicate balance. You very aptly described it.

In this case the state is putting in place regulations, and we will meet what we think is a protective standard. At the same time, given the variety of approaches that different states use, and we are not the only state obviously to have faced contamination situations. We do think it is appropriate to have some sort of Federal floor, if you will, that all states should be required at a minimum to meet.

In our case, had this been in place it is possible—we can't say for sure—that we wouldn't be facing some of the situations that we

are facing, but I was trying to articulate the wide, wide variety, as you rightly point out, of geologic and other physical characteristics and variety of disposal situations that really govern where this material should be placed.

Mr. COSTA. Before my time expires, Mr. Squillace, you were part of the National Research Council I guess, right, on the report?

Briefly, did the committee find efficiencies? Well, obviously the committee did find efficiencies on how State regulates this. What were the recommendations out of the committee's report? You have 40 seconds to answer.

Mr. SQUILLACE. There were a number of recommendations relating both to very generally the need for more standards on disposal. Excuse me. My mic was off.

And regarding those standards for disposal, I would say that the recommendations were somewhat general, but also I think specific in insisting that there needed to be some Federal floor, as Secretary Wilson has already pointed out.

Things like characterizing the CCR material and the site where you are disposing of it, that is not unique to any place. You need to know what toxic constituents you have in these residues before you decide where you are going to dispose of them. The same with the site. You need to know what is at the site and how it might interact with those residues before you can determine whether it is appropriate.

Now, the conditions will be different. We saw a remarkable site in Indiana that is essentially a saturated site, so Secretary Wilson is right that these are site specific kinds of issues, but I think it is also fair to say that there are some minimum Federal standards that can and should be imposed to assure that we have a uniform set of standards perhaps implemented by the states.

Mr. COSTA. OK. Yes. Well, my time has expired and therefore your time has expired as well, but I do want to explore that more, and maybe if we get another round of questions we will go on that in terms of how you would apply that.

The gentleman from Texas is recognized for five minutes.

Mr. GOHMERT. Thanks, Mr. Chairman.

Just following up on that line of questioning, Secretary Wilson, we received a letter from Steven Patterson, the Assistant Secretary. I take it you are familiar with him?

Ms. WILSON. Yes, sir.

Mr. GOHMERT. OK. In his letter he had said the principal authority for regulating waste from the combustion of coal should be at the state level, and I am just wanting to be sure. Are you all saying a similar thing? How do you reconcile what he said as compared to what you are suggesting?

Ms. WILSON. Mr. Patterson is the Assistant Secretary at the Maryland Department of the Environment, and he did send that letter to EPA that you referred to.

The letter was sent earlier this spring in reference to Federal regulation and the notion that there would be regulation of this material as a hazardous waste, which I think we are agreeing that it isn't warranted.

But we have, as a result of the situation that we have experienced in Maryland with the two sites, looked very carefully at real-

ly what the right answer is, and we do think, as Mr. Patterson suggests in that letter, that the states do have the ability to craft the right programs.

What we are saying today is that we do also think it would be beneficial to have some sort of Federal floor, if you will, to ensure consistency in the level of protection that is provided.

Mr. GOHMERT. Well, what if the Federal minimum level is of such a level that it puts Maryland in a real bind to comply because its standards are just a lot tougher than the minimum level there?

I am wondering about that because if that is the case then it clearly indicates the Federal Government thinks Maryland can't do it alone. They are just not capable of doing it alone. We have to do it for them. That is the danger of minimum levels by the Federal Government.

Ms. WILSON. I appreciate the question, and there is a fine line to draw because of the huge variation that we keep talking about with this issue, but the states have a long history of working successfully with EPA on certain issues to craft standards that provide a minimum and then allow the flexibility to tailor the regulatory approach to your unique state's conditions.

Particularly in this area where you have regulation under solid waste laws, under mining laws and under water discharge laws, there are a variety of approaches that can be used and you can envision a scenario where there is some sort of baseline and then the state tailors it to its own particular situation.

Mr. GOHMERT. A good example with regard to air pollution. The Federal standard just bumped down to 75 parts per billion.

Where I live in east Texas, we have tremendous amounts or numbers of pine trees, plants that put out all kinds of pollens and at some certain points of the year it is around 70 parts per billion just from pollen and natural sources, so there is some discussion that in order to comply with the EPA standards on air quality we may need to cut down all our trees and concrete over all our grass in order to really comply effectively.

The state may have been better at forming that in conjunction with what actually is the situation on the ground, and that is always the danger with the Federal Government.

Mr. Goss, do you think the state and Federal regulatory programs the way they are right now bottom line are working OK?

Mr. GOSS. Yes, sir, I do. I believe there is plenty of recourse through the Federal programs, whether with RCRA or through Superfund, to correct issues if a state doesn't intervene, but the states have demonstrated they are more than willing to intervene and address the issues locally as they need to.

Mr. GOHMERT. And just in my last seconds here, the observation I made earlier I am really concerned about, and that is as we have seen energy prices get so high I have seen people whose number one concern previously was making sure we had a clean environment, and now they say the heck with that, make sure I don't lose my job or I get a job.

And so it seems important that we do balance the economic needs with the environmental needs, that we don't push too hard on one at the expense of the other. They do need to work together.

I really appreciate your time and your input today. Obviously five minutes each is not much time, but you provided written testimony. Any other thoughts you may have on things we can improve, we welcome those in writing.

Thank you, Mr. Chairman.

Mr. COSTA. Thank you, my friend.

I would now recognize the gentleman from Maryland, Mr. John Sarbanes.

Mr. SARBANES. Thank you, Mr. Chairman. I want to thank the panel.

Mr. Goss, I was curious. I was reading in your testimony, the written testimony, and you alluded to it today, that you viewed the Gambrills situation as sort of an isolated example of what could happen in terms of the health effects.

I wanted you to expound on that a little bit, I mean, because there seems to be evidence of this happening other places. Why do you refer to it as isolated?

Mr. GOSS. I guess, sir, the reason I would suggest that is because Gambrills demonstrates a process of constructing new disposal facilities that was probably used historically but would not be done today. The issues associated with groundwater impact the placement of the materials, the characteristics of the materials, the local community through engineering processes and design processes that would not occur again.

I don't believe that utilities would take the risk of constructing and disposing of CCPs in a manner that might result in a situation such as was found at the Gambrills site. I think there is kind of a self-policing policy that electric utilities use—there is a certain higher awareness and sense of that concern over the last few years as the reports to Congress, the reports from DOE and EPA talking about disposal facilities.

There is a high percentage of all the new facilities that have been built since say 2000, much more restrictive, state permits in almost every single case covering the design, so I think the Gambrills is kind of a leftover from a previous era, if you don't mind me saying.

Mr. SARBANES. But, Mr. Squillace and maybe Ms. Wilson, there must be a lot of leftovers out there, right?

Mr. SQUILLACE. Leftover?

Mr. SARBANES. Well, Mr. Goss refers to Gambrills as sort of leftover from a previous era when you didn't have in place perhaps a kind of preventive regulation that you would want to have, but it is not isolated in the sense that there is presumably, and I think evidence of in some of the studies that have been done, other leftover situations, quite a few perhaps.

Mr. SQUILLACE. I would say not just leftovers, but——

Mr. SARBANES. Yes.

Mr. SQUILLACE.—even the potential for new problems. There was a really interesting site we visited in New Mexico that was designed on the assumption that this was essentially an arid, dry desert climate that was not going to come into contact with water, but there was no requirement for sort of identifying in land use plans and in the property records that in fact CCRs had been dis-

posed of in massive quantities at this coal site that was undergoing reclamation.

Subsequently up gradient from the site the Navaho Nation had started an irrigation project and was irrigating the land, and presumably the water running through that area then could raise issues that had never even been considered at the time that the disposal was there. There were indeed some problems that were identified down on that site earlier on.

I think that this is certainly an historic problem on some level, but it is a continuing problem, an ongoing problem. I think it is one that we can expect to see problems with in the future.

Mr. SARBANES. Ms. Wilson, you are arguing for, and Mr. Squillace is as well, a kind of Federal baseline from which the states could then add their own particular customized approach, depending on the particular situation and geophysical attributes to the state and so forth.

I think you alluded to it when you were testifying, but would it have been helpful if that baseline had been in place when you had turned to the particular situation that you had in Gambrills, and if the baseline had been in place before perhaps could that situation have been avoided?

Ms. WILSON. Yes. I can't say whether the situation would have been avoided, but I think it would have been helpful to have a baseline in place.

As opposed to these being leftover sites, it is more a matter of we didn't have the regulatory program in place that we ideally would have had so when we talk about a Federal baseline it is making sure all states, including ours, are at a regulatory level that is protective.

Mr. SARBANES. Yes, Mr. Squillace? And then if you could also just comment?

I mean, it seems to me, because I am going to run out of time and the Chairman is being very tight with the gavel, but it seems to me that one argument is there are plenty of sources of authority you could go to to regulate things, but they are disparate and they have to be sort of knitted together under the circumstances.

What a baseline can do is it can raise the awareness level and represents a place where people can turn and get all of the guidance and authority that they need to respond.

Mr. SQUILLACE. I think that is an excellent point, but there is another important point I would like to make, which is the lack of Federal standards, which I think promotes the classic race to the bottom here.

If Maryland decides to adopt more stringent standards for CCR disposal, West Virginia or Pennsylvania or nearby, and the materials could go there. As a practical matter it is heavy. It won't always happen that they will be moved, but if there are options to move the material somewhere else where it is going to be less expensive that will happen.

Mr. SARBANES. Right.

Mr. SQUILLACE. And so it is important to protect the states really in adopting good standards; that there be some basic minimum Federal floor.

Mr. SARBANES. Thank you.

Mr. COSTA. Thank you. The gentleman from Maryland asked some good questions, and we appreciate the response of the witnesses.

Our next questioner is the gentleman from American Samoa, Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I have a lot of coal in my district, so I am very interested in this issue.

Mr. COSTA. We appreciate all your questions.

Mr. FALEOMAVAEGA. Thank you.

I noticed, Ms. Wilson, you stated that 50 percent of Maryland's electricity comes from coal. I wanted to ask Mr. Goss on a national basis, what is the percentage that our nation relies on for its electrical power comes from coal?

Mr. GOSS. As I understand, sir, it is a little bit more than 50 percent of the nation's electricity comes from coal-fired generation.

Mr. FALEOMAVAEGA. OK. I also noticed with interest in the hearing that disposal of coal combustion waste is not currently subject to Federal regulation, and I noticed also in your testimony, Mr. Goss, you do not want the feds to get involved with this. Am I correct on this?

Mr. GOSS. We would prefer their guidance, as opposed to regulations. I can understand that there is a need for guidance for the states to understand what some of the thresholds are, but we don't believe that regulations are required. The states should implement those themselves.

Mr. FALEOMAVAEGA. So almost a suggestion if it isn't broken, why fix it?

Mr. GOSS. Almost to say that.

Mr. FALEOMAVAEGA. Can you say it more emphatically that you don't need Federal regulation or Federal involvement in this?

Mr. GOSS. When you look at the total number of facilities that are doing disposal, it is a very small number that have been identified as potential sources of contamination. The health risks have not been proven in all those cases.

Mr. FALEOMAVAEGA. But there seems to be other testimony to the contrary. There are some very serious problems attending this.

Mr. GOSS. I believe we will hear that. Yes, sir.

Mr. FALEOMAVAEGA. Mr. Squillace?

Mr. SQUILLACE. Squillace, yes.

Mr. FALEOMAVAEGA. I sense in your testimony that you are concerned about the environmental and health consequences of what we are doing now with CCW.

Mr. SQUILLACE. That is correct.

Mr. FALEOMAVAEGA. Can you elaborate just a little further on that?

Mr. SQUILLACE. Sure. The National Research Council committee on which I served was involved in studying a number of sites where contamination occurred, mostly in impoundments and landfills, not so much in the coal mines we were looking at because disposal in coal mines is a relatively new phenomenon that we have been seeing.

But the evidence suggested that there was not a whole lot of information for one thing about some of the impacts that were occurring, and we did see evidence of hazards to human health as well

as the environment and felt the need to recommend minimum kinds of Federal standards that could ensure against contamination.

And so we talked in terms of basic looking at the site where you are going to dispose of these materials and looking at the materials that you are disposing of to determine the extent to which there were toxic constituents that could leach into water supplies and the environment, impact wildlife and health and human health concerns.

We looked at issues relating to performance at the site and monitoring. Some of the monitors that were put in at some of the sites were up gradient from the location of the CCRs, suggesting that they would not likely catch contamination coming off of that site.

Mr. FALEOMAVAEGA. My time is limited. I just wondered. Is there a national standard right now in place?

Mr. SQUILLACE. No, there is not.

Mr. FALEOMAVAEGA. So any state can do whatever or even by being nondiligent, perhaps, and not following up on the environmental and the health consequences of the use of this CCW?

Mr. SQUILLACE. That is essentially correct. In coal mines the Office of Surface Mining is considering establishing standards for disposal there, but they have not done so yet.

Mr. FALEOMAVAEGA. When did this first come about in addressing the serious health issues affecting the CCRs or the coal waste? The last 10 years? Five years?

Mr. SQUILLACE. I can't give you an historical reference, but we have been disposing of CCRs ever since there has been pollution control equipment at coal-fired power plants, which goes back many, many years as you know.

Because it generates a lot of material, you have to do something with it. I think the record on monitoring leaching and contamination from these sites is not very good. Part of the problem that Secretary Wilson identified is the need for more research and studying.

Mr. FALEOMAVAEGA. Real quick, because my time is up.

Mr. SQUILLACE. Sure.

Mr. FALEOMAVAEGA. Which state do you consider perhaps having the highest standard?

Mr. SQUILLACE. The State of Wisconsin I believe has the highest standard.

Mr. FALEOMAVAEGA. Wisconsin. Not California?

Mr. SQUILLACE. I am not familiar specifically with California's standards, but I know Wisconsin has——

Mr. FALEOMAVAEGA. Pennsylvania?

Mr. SQUILLACE. I am sorry?

Mr. FALEOMAVAEGA. Pennsylvania?

Mr. SQUILLACE. Pennsylvania does have some standards I believe. I don't know. I would say Wisconsin probably has higher standards. They don't have coal mines either. They only dispose of it in impoundments and landfills.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. My time is about to go off.

Mr. SARBANES [presiding]. I thank the gentleman from American Samoa.

I am going to do one two-minute lightning round because I just had a real quick question. Mr. Squillace, you may be the best person to answer this. What do we do about the existing—let us take a landfill. Let us take a Gambrills situation.

You know, let us assume that the linings and other kinds of protections that you would put in to prevent leaching——

Mr. SQUILLACE. Right.

Mr. SARBANES.—weren't done, so now you have this situation. What do you do about that? Is there kind of a redisposal strategy that exists or do you just kind of cordon off the site from a health effects standpoint from the population that is there?

Mr. SQUILLACE. Yes. Excellent question. Removing the material once it is disposed of is not a realistic option I would say. The volume of the material that you tend to be dealing with is enormous and so the best you can do is try to ameliorate the harm that is coming.

You have to identify it obviously first. If there is not adequate monitoring below the site to determine whether or not there is contamination coming off of that site, then you may not even know that there is contamination, but once you identify it and realize it is a problem probably the best you can do is try to figure out a way to treat it if that is possible or to manage the water so that it flows in a direction where it is not going to cause problems, but very difficult once the contamination is identified to deal with it and very expensive, I might add.

Mr. SARBANES. OK. Thank you all very much. We will bring the next panel forward.

Mr. COSTA [presiding]. Just a quick question.

Mr. SARBANES. OK. There is a question.

Mr. COSTA. Quickly, Mr. Squillace, I just wanted to pursue where we left off after my questioning in terms of how you would develop your recommendation from the committee.

Mr. SQUILLACE. Yes.

Mr. COSTA. If the Federal Government through the Environmental Protect Agency were to set standards, say—I am being arbitrary. I am picking numbers out of the air, but 2010, 2015, 2020——

Mr. SQUILLACE. Yes.

Mr. COSTA.—and said states, you determine what are the best management practices in your respective state with your regional challenges that you have to deal with.

Do you think that would work in terms of a way to be fair and not to be overly prescriptive?

Mr. SQUILLACE. So a program where the Federal Government sets minimum kinds of basic standards and the states then develop those standards and implement them in their own states?

Mr. COSTA. Right.

Mr. SQUILLACE. Yes, I think that would be a reasonable approach that could be taken here as long as those minimum standards were set and were clear for the states.

As I said, I think the NRC committee's report really does a nice job of outlining the kinds of minimum standards that could be used without being overly prescriptive.

Mr. COSTA. Mr. Goss, do you think that the industry could comply with that kind of a parameter that would create flexibility and in a period of 10 years reach the goals that we are seeking to reach?

Mr. GOSS. Sir, since I represent the ash industry rather than the utilities sector I am a little bit uncomfortable answering that.

It seems like a reasonable timeframe. The Clean Air interstate rule and other regulations have done similar processes.

Mr. COSTA. Yes. Well, the timeframe may not be precise. I am again just talking about a process.

It seems to me that if the Environmental Protection Agency were to set goals, parameters with timelines that made sense, and it may not be within the 10 year period, but what I am trying to understand is would industry be able to accommodate that on a region-to-region basis?

Mr. GOSS. It would seem so, sir. I think the challenge would be defining the risks that would prompt whatever the regulations would be based upon to determine are these reasonable risks. What are the triggers or the points?

Mr. COSTA. Do you mean a risk assessment versus risk management?

Mr. GOSS. Yes, sir.

Mr. COSTA. OK. All right. I have gone way beyond my time, but I did want to follow up on those two points.

I thank the panel, and we will go on to the next panel. All right. I believe we have everyone on our second panel here. I want to introduce our witnesses.

We have Mr. Charles Norris, a consultant with GeoHydro, Inc.; Dr. Thomas Burke, Director of the Risk Sciences and Public Policy Institute at Johns Hopkins Bloomberg School of Public Health; and we have Ms. Lisa Evans, a project attorney for Earthjustice. I think that constitutes the four witnesses.

The same rules apply to the second—I am sorry. And Mr. Norman Harvey, community activist from Maryland. Sorry. I turned two pages over. But it is nice to have all of you here this morning, and we thank you for your participation.

As I was about to say, the rules for the second panel are the same rules that we applied to the first panel, and that means that those timing lights in front of you give you five minutes. When it is green, those are your first four minutes. When it turns yellow you have a minute to complete your statement, and we do need to stay on that timeline to be fair to all the witnesses and to be fair to the Members of the Subcommittee you also have questions as well.

So with that understood the Chair would now like to recognize Mr. Charles Norris to testify for five minutes. Mr. Norris?

STATEMENT OF CHARLES NORRIS, CONSULTANT, GEOHYDRO, INC.

Mr. NORRIS. I would like to thank Chairman Costa and the Members of the Subcommittee for the opportunity to testify today. My background, credentials and disclaimers have been provided to the Subcommittee in writing.

In my brief oral testimony I would like to address limited considerations from my written testimony rather than simply read from it. My focus is on CCW placement in the environment, as opposed to products that would constitute reuse.

Part of the difficulty before the committee is the complexity within the question. There is not a substance that is CCW. There is not one physical, chemical, textual and hydraulic description that is generally characteristic of all CCWs. All CCW is not equally toxic nor equally benign. One size does not fit all.

Similarly, there is not a single site into which people want to place CCW. Each placement site, like each CCW, borders on being unique. All placement sites are not equally risky nor equally protective. One size does not fit all.

Since the waste is complex and source specific and since placement sites have individual properties dependent upon local conditions, is it logical or even possible to regulate at the Federal level? Doesn't state control—it is more local—make more sense? Why Federal action to address issues of risks to health and the environment?

The short answer is that state regulation of these wastes has failed and is failing. Not all states are equally at fault. Some strive mightily to keep regulations in effect that protect all of their citizens. Some have regulations that protect some of their citizens, but at the expense of others. The disparity among states or within a state encourages what has been referred to today as the proverbial race to the bottom.

A Federal framework for the environmental placement of CCW is needed. That framework need not—indeed should not—be an attempt to micromanage the environmental placement of CCW. Like other environmental regulations, Federal CCW rules should set common sense limits on any race to the bottom among states inclined toward such competition.

The Federal framework would guarantee citizens from various states that their protection from CCW risks can be no less than the Federal minimum. The Federal framework would ensure that each citizen of a single state, whether living in quarry belts, mine country or municipalities, would equally have the protection of the Federal framework.

The need for Federal intervention is discussed in my written testimony, and I will not repeat it now. Details of a proposed Federal framework are also in my written testimony. There are four of those elements I would like to emphasize.

First, the framework must use meaningful testing of CCW, including when and how it will react with other site materials. The testing being used now is simply and unquestionably inadequate to demonstrate the efficacy of environmental placement, mine or nonmine.

Literature shows that the EPA and its Science Advisory Board know it. The NRC knows it and discussed it, and anyone who has looked into it knows it. A coal operator cannot use the TCLP or equivalent test on spoil, but the same state regulators blithely accept these tests for the environmental placement of coal combustion waste. These tests are no more useful for predicting or understanding CCW behavior than they are for predicting spoil behavior.

The framework must focus attention on environmental placement of CCW in mines. The post-mining hydrologic environment is highly complex when compared to that of unmined terrain. CCW, like mine spoil, is potentially highly reactive and far from equilibrium of the placement environment. Using CCW to counter some of the risks that result from mining is conceptually attractive but requires a much higher level of characterization of spoils, CCW and the mine setting to reduce, not aggravate, the risk.

The framework should require monitoring that will look for CCW contaminants at times and places they can be identified. Up gradient and in-waste monitoring is part of that system. These simple elements are seldom part of monitoring in mines today and never the case in some beneficial use placement programs.

Finally, CCW is an industrial waste stream, and regulating CCW is rightfully under the purview of experts and regulators of waste. Since U.S. EPA would presumably regulate the environmental placement of CCW outside mines as part of a Federal framework, it would be redundant to develop a comparable team of waste experts among mining regulators to implement the framework in mines. It should be left with the EPA.

Again, I thank you for the opportunity to testify.

[The prepared statement of Mr. Norris follows:]

Statement of Charles H. Norris, Consultant, GeoHydro, Inc.

I would like to thank Representative Costa and the members of the subcommittee for the opportunity to testify today.

Introduction

The question the subcommittee is exploring carries important, implicit understandings in its phrasing. There is implicit understanding that coal combustion waste (CCW) exists. There is implicit understanding that there are health and environmental risks with CCW. There is implicit understanding that the risks need be addressed. There is implicit understanding that federal action is needed to address the risks. I share the each of those understandings with the author(s) of the question, although I must admit resistance in reaching the last understanding.

My understandings are founded in 5 1/2 decades of personal observation, management, and study of CCW. In the 1950s I became responsible for removing, carrying, and dumping the "clinkers" from our coal furnace. They were put to "beneficial use," providing traction and filling ruts on the lane coming up the hill to the farmhouse. In the 1960s, I became painfully aware that even beneficial use of these materials carries risks, as did everyone else who tried to skate on an icy road after the township trucks had spread cinders or who tripped on the cinder track during the handoff in the mile relay. In the 1960s and 1970s, I was episodically subjected to the rain of fly ash and the taste and feel of sulfur dioxide in my throat when the wind was from the university's power plant in Champaign, Illinois. Since the mid-1980s, a significant portion of my professional career has been the study and evaluation of CCW, now remove from the air, and how best to manage it. My client base through the years has included individuals, coal companies, environmental organizations, power companies, governmental units, and citizens' groups.

My testimony today represents my personal understanding and opinions, and is not intended to represent those of any other individuals or organizations. My opinions and understanding have evolved and should continue to evolve as I learn more. If they don't, I should retire. I am not being paid to be here and my preparation for this hearing is similarly donated, although I am seeking reimbursement of direct travel expenses.

I will organize my testimony today around the implicit understandings in the question before the subcommittee, largely providing technical background on CCW based upon my personal experience. Consistent with the question before the subcommittee, I will use the term "coal combustion waste." Some of my testimony will touch on language; the nomenclature and rhetorical battle over these materials. That battle contributes to the need for federal intervention to reverse the deplorable and deteriorating conditions manifest under some state management practices for

CCW and begins to spread to other waste streams. I will illustrate my points with examples from my own experience and have included studies and research with my testimony to that end. These tend to be lengthy, and some are technically detailed. They are not provided with the expectation that you will fully absorb them. Rather, I hope they will convey the complexity of these materials and of their relationships to and reactions with the environments where they are increasingly placed. Generalization about these materials are difficult, and I hope the supplemental materials help illustrate that.

The difficulty with generalization is seen in the implicit understanding that CCW exists. Certainly the burning coal leaves behind material after combustion; tens of millions of tons of each year. But it's not a single material. There is the first-order classification of these materials as fly ash, bottom ash, flue gas desulfurization (FGD) materials, and boiler slag, each of which is very different. The character and composition of these individual materials are themselves variable. They varies over the range of combustion and pollution abatement technologies that are used. They change as the compositions of the fuels change. They are dependent upon other waste streams that are mixed and co-managed with them. Often, state regulations are broadened to include not just the materials that remain after "coal combustion," but the materials that remain after "fossil fuel combustion." Fossil fuel combustion typically represents a mix of little 50% coal with some other fuel; natural gas, petroleum liquids, wood, wood pulp, shredded tires, auto fluff, etc. There is nothing similar between the FGD sludge produced by a dual-alkaline system working on the stack gases of a pulverized-coal conventional plant burning Wind River Basin coal from Wyoming and the bottom ash from a fluidized bed combustion unit burning 50% coal, 30% gob, and 20% shredded tires. Yet, these two materials, among a host of comparably dissimilar materials, are within the term "coal combustion waste" in the question before the subcommittee, and all need fall under the rubric of federal control.

The challenge at the federal level of addressing health and the environment from risks of this complex of materials does not lie with legislating the detailed management of each material. It lies with producing a framework that provides regulation of each of these materials in a manner that is protective of health and the environment when implemented by state programs. The implementation would be based upon individual CCW characteristics, the nature of its placement and use, the environment of its placement and use, and the time-dependent changes that CCW and the environment work upon each other. The model for this framework is not unlike that of SMCRA or the CWA. I believe producing the framework will be a challenge because such a framework would be a sea change from the approach taken today by some states in response to the systematic hesitation and reluctance of federal regulators to meaningfully regulate these materials.

In the remainder of my comments, I will briefly outline examples of the need for federal intervention based upon what has and is happening under state regulatory programs. I will then provide an outline of issues the federal framework will need to address to be effective. Finally, I will discuss the issues of nomenclature and rhetoric that are driving not only the management of CCW but increasingly undermining the responsible regulation of other wastes streams.

The Need

Placement of CCW in the environment creates environmental damage and human health risks. Not every CCW. Not all placements. Not always without some offsetting benefit. However, documented degradation coincident with the placement of CCW in the environment occurs so frequently, in such a wide range of settings, that there must be the presumption that unacceptable risk to health and the environment will occur as a result of such placement. The frequency of such degradation is particularly disturbing when one considers, first, how rarely such placement is accompanied by monitoring at times and places capable of detecting a problem, and second, how frequently the some state agencies ignore the degradation and allow it to continue. Too often, there is no agency response to a problem at all or until affected citizens have had to file legal action for relief. Further, under existing and evolving state programs, the characterization of placement sites is being reduced and monitoring of placed CCW is occurring less often and for shorter periods of time. Intervention to prevent risk to health and the environment from degradation is increasingly impossible because there is no observation.

Examples of degradation are readily found despite the paucity of sites with monitoring data that allow evaluation. The following are some representative examples of the variety and range of problems with in-environment placement of CCW:

Fly ash was placed in an open, unlined excavation as permitted landfill disposal adjacent to Town of Pines in Indiana beginning in the 1970s. Leachate from that

ash, passing under the residents' houses, ruined their water supply on its way to local drainage to Lake Michigan, forcing them to accept municipal water as a replacement. The site is undergoing an RI/FS under the SuperFund program.

In Maryland, operators of ash disposal pits are today wringing their hands over ruined residential wells, questioning how they could have ever anticipated such problems from benign materials compliantly disposed.

In Illinois, CCW placement as permitted landfill disposal in a dolomite quarry degrades ground water as a result of off-site, third-party changes to the hydrogeology that had been relied upon to contain the waste.

In Pennsylvania, regulators document ground- and surface water contamination at permitted CCW disposal facilities that in cases rely only CCW for containment. Dilution by the receiving body of water is accepted as a response by the agency.

In Colorado, the USEPA fell victim to beneficial use. Uranium tailings at a site within Denver were "stabilized" using CCW with a liming additive. The objective was to allow reburial of the stabilized tailing on-site, rather than expensive transport and disposal at a rad-waste facility. The "beneficial use" effect lasted only a few months before uranium mobility from the site increased beyond the pre-treatment levels, necessitating the transport and landfill disposal of not only the uranium wastes but also the admixed coal combustion materials.

Contamination examples are also common when CCW is placed in coal mines. The Clean Air Task Force (CATF) contracted an exhausting, multi-year study of the contamination at coal mines that placed CCW as part of the Pennsylvania mining program for beneficial use of CCW. That study found in agency permit files data showing CCW contributions to rising contamination at the majority of the sites with sufficient data to make a determination.

Two of the accompanying documents I am providing with my testimony discuss contamination resulting from the placement of CCW in mines. Some of these placements were beneficial-use placement and some simply disposal placement. In my 2003 report "Minefill Practices for Power Plant Wastes, An initial Review and Assessment of the Pennsylvania System," I discuss my preliminary review of 10 mine sites in Pennsylvania that saw to CCW placement and showed subsequent related contamination. Many of these sites were studied in more detail as part of the CATF study mentioned above. The second paper, "Environmental Concerns and Impacts of Power Plant Waste Placement in Mines," was presented in 2004 and published in Proceedings of State Regulation of Coal Combustion By-Product Placement at Mine Sites: A Technical Interactive Forum, Kimery C Vories and Anna Harrington, editors, by U.S. Department of the Interior, Office of Surface Mining. This paper discusses eight mine sites in Pennsylvania (some duplicated in the CATF study), West Virginia, Indiana, and New Mexico where CCW placement can be tied to subsequent ground water contamination.

Where data exist than can be assessed, the frequency of contamination from the placement of CCW is attributable largely to weakness in state programs for site characterization waste and waste characterization. The dearth of interpretable data from most sites is attributable to poor site characterization, poor waste characterization and inadequate monitoring. In the discussion of each below, it should be apparent that the three weaknesses are intimately related.

Monitoring

The first requirement to detect the impacts from the placement of CCW in the environment is a monitoring system and program. One cannot document impacts, or lack of impacts, due to CCW placement without a monitoring program that looks for such impacts and a monitoring system that is capable finding such impacts when they occur. Yet, as more and more CCW is placed under programs of beneficial use, there is an ever-expanding population of placement sites with no monitoring.

To detect impacts from the environmental placement of CCW, a monitoring system must monitor the path(es) of contaminant migrating from the placement area. This requires there have been a site characterization that establishes the migration direction(s), including seasonal variations, of contaminants from the placement area via air, surface water, and ground water. Further, since placement of the CCW can modify these flow directions, the characterization needs to describe the medium-specific migration directs that will exist after CCW placement, not merely conditions existing prior to placement.

To detect impacts from the environmental placement of CCW, a monitoring system must be able to detect and identify all contaminants migrating from the placement area. This requires there have been waste characterization that identifies all mobile concentrations of contaminants from the waste, seasonal variations in the mobile contaminants and their concentrations, and long-term changes in the population of mobile contaminants.

To detect impacts from the environmental placement of CCW, a monitoring location must be active when contaminants from the placement area are moving through the monitoring location. This requires there have been site characterization that is sufficient to project contaminant migration times to a point of observation. It also requires a monitoring program that remains in place long enough for contaminants to reach the monitoring point.

To detect impacts from the environmental placement of CCW, a monitoring system must be able to detect and identify contaminants mobilized by site leachates, whether or not the contaminant is itself released from the placement area. This requires there have been waste characterization and site characterization that is adequate to simulate the reactions between waste leachate and site soil and rock materials in contact with the leachate. For example, one presumed beneficial use for CCW is alkaline addition to areas that have long suffered from acid mine drainage. However, apparently obvious solutions can have unfortunate consequences. I have included another paper with this testimony that illustrates one example. My 2005 paper "Water Quality Impacts from Remediating Acid Mine Drainage with Alkaline Addition" explores the geochemistry that supports observations of arsenic contamination following the use of CCW as an alkaline addition, even when there is no evidence of excessive arsenic in the CCW leachate itself. Alkaline leachate from the CCW mobilizes previously-sequestered arsenic from on-site sediments.

Site characterization

Adequate site characterization is seldom performed prior to approval for environmental placement of CCW. Depending upon the state, no site characterization may be required prior to some beneficial use placement. In other cases, something as simple as establishing the depth to water table prior to placement may be all that is required. Placement for beneficial use does not preclude negative environmental or health impacts, nor ensure that there is even a net improvement when benefits are weighed against negative impacts. Site characterization is as necessary at sites of environmental placement for beneficial use as for disposal.

When the placement activity includes site characterization, that characterization virtually always is of the conditions that exist prior to, not subsequent to waste placement. Seldom does CCW placement leave the hydrologic balance as it existed before placement. As a result, monitoring systems are designed to measure a flow system with no waste in it, not the one with waste present. This inadequacy is dramatically in evidence when considering placement in areas that have been mined or quarried. Coal mines and bedrock quarries typically entail huge dewatering programs. Coal ash placement, reclamation and bond release can occur decades before the mined areas reach full, equilibrium recharge, and during that time ground water is flowing into the void, not from it. The monitoring system, when there is one, is monitoring background water flowing toward the placement area, not water from the placement are and cannot possible convey information about the health or environmental risks associated with the eventual hydrologic system that will finally develop.

Site characterization seldom includes a characterization of the anticipated time-dependent variations of the site hydrogeology. This problem is very commonly observed for placement in coal mines. The Prides Creek Mine example in the previously cited "Environmental Concerns and Impacts of Power Plant Waste Placement in Mines" shows one case. Even when there is an intra-mine monitoring point that shows the strong temporal variability of water quality and ground water heads, there is no characterization to provide context for those changes.

Waste Characterization

This aspect of the various state-managed CCW programs is so weak as to be nearly meaningless in most states. Typically state programs use the results of the TCLP (toxic characteristics leaching procedure) or the SPLP (synthetic precipitation leaching procedure) as the predictor of the potential for placed CCW to impact health or the environment. This myopic misuse of laboratory index tests is probably the single greatest cause of the disconnect between the contamination that occurs from environmental placement of CCWs and what is promoted by advocates and regulators of the materials.

There is no justification for states to use these index laboratory tests as surrogates for determining likely field leachate for CCWs to be placed. These tests were not developed as predictors of field leachate, they are not designed to produce field leachate, and they have been repeatedly demonstrated incapable of doing so. The National Academies of Science understand this. The USEPA Science Advisory Board understands this. Yet, based upon the results of these inappropriate tests, multi-million ton masses of CCWs are allowed by some states to be placed without con-

finement and without monitoring in high risk hydrologic environments adjacent to private well users. And, the producers of the coal combustion and the regulators who approve it waste feign surprise or innocense when wells become contaminated.

If waste is to be placed in the environment, whether for disposal or beneficial use, complete and meaningful characterization is quite simply mandatory if the placement is to be protective. That testing, to be adequate for both instantaneous characterization of the waste and the design of the initial monitoring system, should include analyses of grain size and texture, elemental composition, chemical composition, mineralogy, rheology, hydrological properties, initial leachate compositions, and reactive potential with non-waste site soils and rock. Only with such characterization can any benefits be weighed against impacts and risks of placement. And only with such characterization can adequate monitoring be designed to confirm design predictions and measure site performance.

Finally, characterization of the CCW requires consideration of the time factor. The most abundant CCWs are highly reactive. They form in an environment that is completely out of equilibrium with the placement environment. Water is a solvent that carries dissolved contaminants away from the placement area and facilitates reaction with site soils, rock, and water. But it is also a major reactant with the wastes. Fly ash fresh from the burner is not the same material as fly ash that is quenched and sluiced to a pond. Nor is the fly ash that is dredged from the pond the same material as the fly ash in a pit five years after placement. CCWs evolve continually for years.

A test of ash fresh from the burner—whether for composition, mineralogy, texture, strength or leaching—will be different from that same ash after quenching and sluicing, which will be different after placement, which will be different 10, 20 and 50 years after placement. As the in-place ash evolves, so will the composition of the leachate from the ash. Contaminants that were sequestered in the young ash can become mobile the ash matures. Concentration of contaminants can rise, fall, and rise again, depending on the stage and sequences ash weathering. Eventually the glass component of some ashes can devitrify, producing late stage mobility of previously sequestered contaminants.

CCW characterization as performed today in the state programs virtually ignores the time factor and the recognition that ash will ultimately evolve to something quite far from its starting point. This is somewhat ironic with respect to CCW placement in coal mines. State mining regulators would laugh an operator from their offices who seriously proposed to use TCLP or SPLP to evaluate the acid producing potential of mine spoil. Yet, under state programs, those same regulators blithely allow those tests to predict the alkalinity that will be needed from the ash to neutralize delayed acid generation when CCW is used for alkaline addition. The 2002 evaluation I performed for Anker Energy and the West Virginia Highlands Conservancy, described in the attached paper "Assessment of the Anker Energy Corporation proposal for mining and reclamation, Upshur County, West Virginia," undertook a far more detailed evaluation of initial leaching characteristics. That evaluation, confirmed by an on-site pilot study, established that for the ash in question, the bulk of the ash's alkalinity would immediately flush from the placement area, leaving insufficient alkalinity available when acid mine drainage would be generated.

So long as waste characterization is driven by TCLP and SPLP results, there will be no reliability in the predicted results of CCW placement in the environment. And, based upon observed changes proposed and implemented in state programs, including increasing CCW masses in and approvals of unmonitored, unconfined placement for beneficial uses, it is apparent that direction is needed at the federal level.

The Framework

The successful construction of a new framework to address risks associated with CCW will require whole-hearted acceptance of the core element implicit in the question before this subcommittee, that it is appropriate for the federal government to step in to address the problems inherent in the management of these materials. Key elements of that framework are described in this section. Comparable elements of a framework applicable specifically to mine placements are described in the 2003 paper I produced for the USEPA and have attached with my testimony, "Developing Reasonable Rules for Coal Combustion Waste Placement in Mines. Why? When? Where? How?"

General Considerations

CCW is an industrial solid waste. Its placement must be in compliance with solid waste laws, clean air laws, and clean water laws. If it is placed or used in coal

mines, placement also must be in compliance with state and federal surface mining and reclamation laws. State policy cannot be less protective than federal law.

Responsibility for the waste and any resulting damage remains with both the waste generator and the operator of the waste placement site.

Regulations must provide enforceable standards of both condition and performance, not merely discretionary guidelines. Oversight of the program must be by professionals trained and knowledgeable in waste disposal law, regulation, policy and practices. CCW placement site operators must demonstrate knowledge of, and the capability to fully implement waste disposal law, regulation, policy and practices.

Regulations must allow for public participation in the approval process, there must be the right of appeal, and cost recovery for successful appeal and citizen enforcement must be included.

Waste Characterization

Each CCW proposed for environmental placement shall be analyzed for grain size and texture, elemental and chemical composition, mineralogy, rheology, and hydrological properties. The constituent list will include all reasonably anticipated constituents of CCW and include tests for total radioactivity and radionuclides with environmental or health standards, and tests for polyaromatic hydrocarbons and other products of incomplete combustion of environmental and health concern.

When multiple CCWs are proposed for placement in a single location, the wastes shall be characterized individually, as above, and as a composited sample proportionate to the masses of the individual waste streams. This applies to both multiple waste streams from a single generator and waste streams from multiple generators.

Leachate Characterization

Prior to permit approval, the placement site operator will demonstrate to the extent possible the composition or limits on composition of the leachate(s) that will form at the site under the conditions of placement. This demonstration may include field testing, laboratory testing (sequential batch tests, column tests, etc.), computer modeling and/or other appropriate methodologies. The analyte list will be the same as for waste characterization.

For each placement area with different waste streams deposited, the placement site operator will install a monitoring well capable of sampling the leachate(s) that form in the field. Field leachate(s) will be sampled and analyzed for the same constituent list as for waste characterization.

Site Characterization

Site characterization will be comparable to that required for solid waste disposal facilities designed for wastes of comparable physical and chemical properties, and will use methodologies and protocols appropriate for solid waste disposal facilities.

Site geology will be characterized sufficiently to demonstrate the structure; bedrock stratigraphy; sediment, soil, spoil, fill, and waste distribution, composition, and texture; and geomorphology that will exist at and under the placement site(s) and in the adjacent areas.

Site hydrogeology will be characterized sufficiently to demonstrate the ground water and surface water systems and exchanges between them before, during and after CCW placement. The site characterization will include determining recharge areas, discharge areas, base flow contributions, hydraulic gradients, dominant flow paths, fluxes, velocities, travel times, physical properties (permeabilities, porosities, pore systems) for each material including CCW, water users and usable water resources, water chemistries, and the range of temporal variations typically experienced and likely to be experienced by any of these parameters. The description of this characterization will include a projection of the post-placement conditions.

Site characterization itself will be performed in a manner that will not be environmentally damaging to areas adjacent to or beneath the placement site(s).

Due to the highly transient stresses that will be imposed upon a placement facility during the construction, use and recovery, the site characterization should be continually updated through the life of the project as more data become available.

Fate and Transport of Leachate

Prior to issuance of the permit, the evolution of the chemistry of expected leachate(s) must be evaluated for each of the dominant flow paths as contact with ground water and migration through soil, and/or rock occurs. If the flow path involves the transport of leachate to a surface water system, the evaluation must include the evolution of the chemistry with respect to reactions with the mixing waters and the gases of the atmosphere. The evaluation will include major-, minor-, and trace-element compositions, and may be based upon field testing, laboratory testing (sequen-

tial batch tests, column tests, etc.), computer modeling and/or other appropriate methodologies.

If, after collection, actual field leachate differs significantly from the projected leachate(s), the evaluation(s) will again be performed using the field leachate composition(s).

The impacts of the leachate(s) on biota or on the uses of the water at receptors or compliance points will be evaluated, and the composition of the leachate(s) relative to applicable standards.

Monitoring

Prior to issuance of the permit, air, ground water, and surface water monitoring will be performed that is sufficient to document ambient air, ground water, and surface water quality; surface water quantity; and flux exchanges between ground and surface water for the range of temporal variations typically experienced at the placement site. Methodologies and protocols appropriate for waste disposal facilities will be used.

During the life of the placement operations, ongoing air monitoring of the placement work site and adjacent areas will be done for both dust and fugitive waste. Surface water discharges from the placement site will monitored for the full list of constituents used in characterization. Ground water will be monitored for both heads and chemistry, and surface water monitored for chemistry. The head data will be used to evaluate the validity of the site characterization and water chemistry will be used to verify that the CCW placement operation is not having negative impacts on downgradient or downstream water quality. Methodologies and protocols appropriate for waste disposal facilities will be used.

After placement is completed, ground and surface water monitoring will occur at locations and from wells capable of sampling leachate(s) from the placement site. Post-placement monitoring will continue until it is determined that leachate(s) have reached the wells, that site performance is as predicted in the permit, that the impacts and compositions at compliance points or receptors are within standards or are acceptable in the absence of standards, and are stable. Methodologies and protocols appropriate for waste disposal facilities will be used.

Compliance, Enforcement and Remediation

Compliance standards for each constituent of potential concern must be defined for surface water discharges, base flow discharges, placement-site air quality, fugitive dust off-site, fugitive waste off-site, and ground water.

Enforcement procedures must be defined and in place prior to permit issuance.

Remediation standards and procedures must be defined, and sufficient financial surety to perform necessary site, surface water, or ground water remediation must be demonstrated and maintained until monitoring is no longer required as provided above.

Isolation of Waste

If characterization and fate and transport analyses do not demonstrate that compliance will occur without barriers and or other containment procedures, the CCW placement cannot occur without extra measures to demonstrate compliance with performance requirements.

Informed Consent of Property Owners

Existing property owners must be advised of the following as part of obtaining consent for placement: a) the proposed activity is solid waste placement, b) the CCW will in all likelihood be or contain toxic forming material, c) the location(s), depth(s), and tonnages that may be placed of on the property, d) the source of the CCW(s), e) the composition of the CCW(s) and leachates, and f) that future buyers of the property have the right to disclosure of the CCW placement activity.

If CCW placement occurs at any surface mine, whether pre-law or post-law, the surveyed location, depth, quantity and character of the CCW shall be recorded with the deed for the property. This applies to state, corporate, private or abandoned mined lands.

Nomenclature and Rhetoric

Much time and fury is devoted to the nomenclature associated with the materials that remain after the combustion of coal with or without other fuels, far more time than is necessary or constructive.

> It's coal combustion (CC) waste. It's CC product. It's CC byproduct. It's CC residual. It's not "waste," because it can be reused. Until it is used in a product, it is a waste. It's pejorative to use "waste" and that makes it harder to convince people to reuse it. Euphemistic phraseology lowers the per-

ception of the need for protection. Dumping of these materials should be managed like the disposal of any other waste. It's not being disposed, it's being beneficially used. Ad nauseam.

There is a method to the verbal madness, of course. If one defines the vocabulary, one controls the debate. It's why trade organization employees monitor and control even the text of Wikipedia entries on combustion wastes.

Although the policy debate is influenced by the vocabulary, the reality and the science are not. Filling an open, unlined pit in Indiana with fly ash, while calling it landfill disposal, ruined an aquifer and created a SuperFund site. Had it been called beneficial use, it would have still ruined the aquifer and created the SuperFund site. There would be no lower environmental and health risks were it called coal combustion product instead of coal combustion waste. The ill-chosen placement methodology of inappropriate CCW created the problem, not the nomenclature, and changing the labeling does not change the chemistry or the hydrogeology a whit.

However, increased sophistication in language management has changed CCW regulation in Indiana. Because the Pines ash would pass the TCLP/SPLP characterization criteria, placement of Pines-like ash in a Pines-like pit today can be called beneficial use, structural fill. For beneficial-use placement as structural fill, Indiana doesn't require ground water monitoring, the kind of monitoring that ultimately allowed the citizens Pines to document their contamination. The program improvement for industry is that industry can claim a higher rate of "reuse" of this CCW for exactly the same placement practices. The program improvement for Indiana is that it needn't see a problem. And neither industry nor Indiana has to deal with a SuperFund site. If the next Pines is to be avoided, its citizens need help from Washington.

Don't mistake these comments as a criticism focused on Indiana or of pit-filling. Recently, in Virginia, several millions of tons of a CCW source that created contamination problems at a controlled, monitored, on-site landfill was approved for the "beneficial use" of sculpting rolling terrain for a golf course. The placement is without containment, without leachate collection, and without the monitoring of a disposal facility than could detect a problem. The site characterization consisted of determining the elevation of the water table pre-project, not after completion of the placement. The waste characterization was by TCLP and/or SPLP. It is in compliance with Virginia regulations. Media and citizen concern over the disconnect of problems at a permitted waste disposal facility and open placement in a neighborhood led to this spring to testing of residential wells adjacent to the placement area. The initial, limited testing by the city, not the Commonwealth, identified problematic concentrations in some wells of boron, a common contaminant in fly ash. Further evaluations are continuing by citizens and by the city.

Time and further evaluation will tell if the golf course is an early-stage Pines. But, the evolution so far is eerily similar to that at Pines. Local investigation finds a water problem with citizens' drinking water. Regulators assure that the placement in the neighborhood of a waste with a history of problems was done in compliance with their regulations. "But, what about the water?" "The waste placement complies." Something isn't right, and needs to be fixed.

In an absence of meaningful direction and oversight at the federal level, state regulation has entered a race to the bottom with respect to regulatory control over placement of CCW. The definitions of "beneficial use" are expanding and the criteria of a waste to qualify are relaxing. There is a concomitant relaxation of management controls, waste and site characterization, and monitoring. The cycle creates the statistical illusion of increased "reuse" while setting up long-term environmental and health problems in state after state; in mines, gravel pits, quarries, or simply fills. Increasing, the public is blind to the development of problems. And, as one state relaxes the controls yet further, others competitively follow.

As the acceptance of the beneficial use approach deepens at the state level, documentation of the problems becomes increasingly difficult because there are no monitoring data. One actually hears the argument in favor of beneficial use that there are no problems seen at beneficial-use sites, unlike waste disposal sites. My grandson, by age three, knew that covering his eyes didn't make spilled juice go away. It is sophistry to argue that no evidence of impacts, as the result of not looking for impacts, is affirmative evidence of no impacts. Yet that is just what some proponents of environmental placement of CCWs suggest.

There is another problem developing out of the CCW management approach that, while unrelated directly to CCW, will be impacted by the actions of this committee. Until credibility is brought to the regulation of coal combustion materials, there will be increasing collateral damage as well. State regulators are being approached by industry to implement the beneficial-use approach to other waste stream, particularly with respect to the misuse of the result of TCLP and SPLP. Functionally, the

argument becomes, "If I can control the chemistry of a handful my waste for the eighteen hours of your lab test, I should be allowed to place my waste in the environment, without containment and without monitoring, just like you allow for CCW, for a beneficial use." The argument is even being extended by one Illinois company for delisting of at least one listed RCRA hazardous waste.

Conclusion

A rose by any other name still has its thorns. Labeling an environmental placement of CCW a beneficial use does not reduce damage that may be done or the risk to health and the environment. If a CCW has a legitimate beneficial impact, one that can demonstrated and quantified, do so, and analyze the entire costs and risks of the placement, and compare that with quantified benefits. Maybe for a particular placement, the benefit is projected to exceed the impacts and increased risk to health and the environment. Even when so, stewardship of the placement is critical to verify nothing was done that wasn't projected. But that approach is not the approach today, and the shift will have to come with federal involvement.

As a society, we used federal action to reduce the health and environmental risks of the physical and chemical rain from the stacks decades ago. For most of us, the air improved, and with it, the environment and our health. But the toxins don't go away; we just capture them. Just as a federal framework was needed then to guide states in addressing risks to health and the environment by dispersing these materials, it is needed again to address the risks from the same material, now accumulated instead of dispersed.

Again, thank you.

[NOTE: Attachments have been retained in the Committee's official files.]

Mr. COSTA. Thank you very much.

Our next witness to testify is Dr. Thomas Burke, the Director of Risk Science and Public Policy Institute at Johns Hopkins University and the School of Public Health.

STATEMENT OF THOMAS BURKE, DIRECTOR, RISK SCIENCES AND PUBLIC POLICY INSTITUTE, JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

Mr. BURKE. Thank you, Mr. Chairman. Thank you, Mr. Chairman. It is a privilege to be here.

Mr. COSTA. Excuse me. The Johns Hopkins Bloomberg School of Public Health.

Mr. BURKE. Bloomberg, yes. The mayor.

Mr. COSTA. The mayor of New York may not like that omission. Thank you.

Mr. BURKE. OK.

Mr. COSTA. Please proceed.

Mr. BURKE. Thanks for having me here. I actually want to acknowledge my colleague, Dr. Mary Fox, originally invited can't be here. Her new baby daughter arrived a little bit early, but I am very glad to be here.

I worked with her and actually became involved at the request of the Health Department in Anne Arundel County, who was really trying to grapple with this issue as a county health department and really challenged by that and came to us for help in assessing the public health risk.

I am going to focus very quickly on the public health risks of these complex sites and have a couple of quick slides. First of all, as you heard, coal combustion wastes are a complex mixture of many, many compounds produced in enormous amounts. This combination of very high volume and lots of toxic substances presents a real public health challenge.

The next slide shows the pathways of potential exposure for a typical buried site. I think we have focused on groundwater contamination, and the EPA risk assessment has looked at kind of pathway-by-pathway, substance-by-substance, but it presents a real challenge from airborne, from indoor, from soil exposure, as we have learned from our experience in Maryland.

I think the long-term issue of contamination of an aquifer with this kind of complicated waste is a real challenge. Once you lose an aquifer it is forever.

The next slide? In Anne Arundel County, as I mentioned, we were approached and the county health department, with very limited resources, was sampling drinking water wells of nearby residents complaining of things and found concentrations of aluminum, arsenic, beryllium, cadmium, lead, manganese and thallium above the drinking water standards. This really prompted things to move forward.

In the next slide, and I am sorry for the small print, but I just wanted to present the tremendously complex mixture of well-recognized hazardous substances.

Mr. COSTA. What does that slide say?

Mr. BURKE. This slide is a list of perhaps the most well-documented hazardous substances, things like arsenic, things like cadmium and lead and manganese and nickel and strontium and thallium, which are present and actually concentrated in the waste and which have been recognized to cause adverse health effects.

The reason I present this slide is because you will see there are a number of things that affect the same organ systems, a number, for instance, of neurotoxicant materials. If we take them one at a time, we may be underestimating the risk, and that is my next slide. The current methods available to assess the risks are there, but with the current regulatory strategies it really takes one thing at a time and may vastly underestimate the risk.

Let me finish with a couple of conclusions here. One, we know from experience and the vast volumes of waste that this waste is a complex mixture, and it can be mobilized in the environment. It depends very much on site characteristics. Location is everything. Site characteristics are everything.

People are exposed and have been exposed through multiple means, including inhalation, direct contact, ingestion, and exposures may occur both indoors and out. The current approaches to evaluating risks are very limited, and they may underestimate the true risks.

We experienced that firsthand working with Anne Arundel County trying to use drinking water standards to understand the impacts of the local wells that were contaminated from the sites. The health effects of exposure therefore might be underestimated unless we take into account the cumulative and additive effects of the multiple pathways, the multiple contaminants.

The bottom line really is it should be all about prevention and site characterization, understanding the individual sites. As you heard, there are many different types of sites, many different conditions. This is essential to good public health that the prevention of exposure is really going to be through better management of the waste, better monitoring of the sites and better capacity at the

local and state level, as well as strong Federal guidance to move forward because the cost of cleanup and the loss of the natural resources such as drinking water aquifers may really overwhelm the cost of disposal.

Thank you.

[The prepared statement of Ms. Fox follows:]

Statement submitted for the record by Mary A. Fox, PhD, MPH, Assistant Professor, Johns Hopkins Bloomberg School of Public Health

Introduction

I thank you for the opportunity to testify today concerning the health effects of exposure to coal combustion waste. I am Dr. Mary Fox, Assistant Professor in the Department of Health Policy and Management in the Johns Hopkins Bloomberg School of Public Health. I am a risk assessor with doctoral training in toxicology, epidemiology and environmental health policy. I am a core faculty member of the Hopkins Risk Sciences and Public Policy Institute where I teach the methods of quantitative risk assessment. In my research I evaluate the health risks of exposure to multiple chemical mixtures.

My testimony focuses on the health effects associated with exposure to coal combustion waste and assessing the public health risks of such exposures.

Background

According to a recent report from the National Research Council, coal combustion waste includes several waste streams produced at coal-fired facilities, for example, bottom ash and boiler slag from the furnace, and fly ash and flue gas desulfurization material collected by pollution control devices (NRC 2006). The amount produced annually in the U.S. exceeds 120 million tons or enough to fill a million railroad coal cars (NRC 2006). Coal combustion waste has numerous inorganic constituents, many of which are associated with health effects in studies of animal or human exposures. Exposures to human populations may occur depending on methods of coal combustion waste disposal. A summary of health effects information for coal combustion waste constituents following studies of oral (ingestion) exposures is provided below.

From a public health perspective it is interesting to note that the current concerns about coal combustion waste disposal are in part a result of regulatory success at protecting air quality. Two of the waste streams that contribute to the total production of coal combustion waste are from pollution control technologies in place to maintain clean air. Our efforts to minimize air emissions have resulted in a shifting of toxic constituents to another less well-regulated waste stream with potential to release the toxins into other environmental media.

Evaluating potential health risks from exposure to coal combustion waste

Methods of coal combustion waste disposal and potential for human exposure

Several methods of coal combustion waste disposal were identified by the National Research Council committee including placement in lined or unlined landfills, placement in lined or unlined surface impoundments, use in engineered products such as cement, placement or use in coal mines (NRC 2006). If the coal combustion waste is in contact with surface water or groundwater, there is potential for the waste to be mobilized into the surrounding environment by leaching or runoff. During transport or placement (dumping) coal combustion waste may be entrained in air. Humans may come into contact or be exposed to coal combustion waste that has been mobilized into the environment from a disposal site. For example, if coal combustion waste leachate is in groundwater it may reach drinking water wells. Coal combustion waste entrained in air may be inhaled, may settle on soil or be transported into buildings through air transfer or on shoes or clothes.

Management of coal combustion waste is a national issue that affects communities around the country where disposal sites are located. Not far from here in Anne Arundel County, Maryland, coal combustion waste has been disposed of in a sand and gravel pit. The county health department has sampled the drinking water wells of nearby residents finding concentrations of aluminum, arsenic, beryllium, cadmium, lead, manganese, and thallium at levels above primary and secondary drinking water standards in some wells (Phillips 2007). It appears that coal combustion waste buried in the former sand and gravel pit is leaching into groundwater.

Health effects information on constituents of coal combustion waste

Health effects information is available for the majority of coal combustion waste constituents. See Table 1. The types and severity of the health effects range from benign and cosmetic effects to changes in organ or system function to cancer. Several coal combustion waste constituents share a common type of toxicity or target organ or system. Three coal combustion waste constituents have neurological effects (aluminum, lead, manganese); three (barium, cadmium, mercury) have effects on the kidney; three have a variety of effects on blood (cobalt, thallium, zinc); two have effects on the gastrointestinal system (beryllium and copper). If exposures to these mixtures occur, there is a greater chance of increased risk to health.

The health effect information for coal combustion waste constituents in Table 1 was gathered from the Centers for Disease Control and Prevention (CDC), the Agency for Toxic Substances and Disease Registry (ATSDR) and the U.S. Environmental Protection Agency Integrated Risk Information System (IRIS). The health effects information listed comes from studies of exposure by ingestion. The listing of coal combustion waste constituents was developed from the National Research Council 2006 report "Managing Coal Combustion Residues in Mines".

Assessing risks to human health

Environmental public health agencies such as the U.S. Environmental Protection Agency routinely use human health risk assessment to evaluate health impacts of exposure to contaminated environmental media such as air and drinking water. Human health risk assessment is a systematic process that combines available data on the contaminant of concern as described in the National Research Council report "Risk Assessment in the Federal Government: Managing the Process" (NRC 1983). The four basic steps of a human health risk assessment are hazard identification, dose-response assessment, exposure assessment and risk characterization. Hazard identification summarizes information on the health effects related to exposure to the contaminant of concern. (As presented in Table 1, hazard information is known for the majority of coal combustion waste constituents.) Dose-response data are developed from research studies and describe the quantitative relationship between exposures and changes in rates of diseases, or other health effects such as organ function changes. Dose-response data are available for the majority of coal combustion waste constituents presented in Table 1. The magnitude, duration and amount of contact the individual or population of concern has with the contaminant of concern will be described in the exposure assessment. The nature of exposure to coal combustion waste will be highly variable depending on conditions at the site of disposal. The risk characterization combines the exposure and dose-response data to evaluate the likelihood of increased health risk.

Human health risk assessment methods are available to evaluate multiple chemical exposures (EPA 2000). Coal combustion waste is a complex mixture of constituents. Risk assessment methods for multiple chemical exposures will be essential to evaluating health risks of exposure to coal combustion waste.

Three of the four common coal combustion waste management practices (landfill, surface impoundment, use in or reclamation of mines) result in localized disposal. Communities surrounding such disposal sites are typically small. Proximity to the coal combustion waste disposal site will likely spur interest in evaluating community health. Unfortunately, systematic health effects research in any one small community will have limited statistical power to detect changes in health outcomes.

Reducing risks to human health

Risks to human health are increased if people are exposed to coal combustion waste. The tremendous volume of this waste generated and disposed of each year in communities throughout the country represents an enormous public health challenge. People are exposed if coal combustion waste is dispersed into the broader environment by runoff, leaching or entrainment in air. Dispersal of coal combustion waste into the broader environment will be reduced or eliminated by disposal practices that contain the waste away from contact with ambient air, surface water and groundwater. Human health risks are reduced or eliminated if human exposure is reduced or eliminated.

Conclusions

Coal combustion waste is a mixture of well-recognized substances. The approach to evaluating exposures to coal combustion waste should acknowledge potential interactions among the constituents in the body. Methods are available to assess health risks from exposure to mixtures of chemical substances, however, current regulatory strategies were not designed to control such mixture exposures. Coal

combustion waste disposal practices must be improved to ensure population exposures are controlled through appropriate long-term containment and management.

Main points:

- Large volumes of coal combustion waste are produced and disposed of in the U.S. every year.
- Coal combustion waste is a complex mixture that can become mobilized in the environment, depending on disposal methods used.
- People are exposed through multiple means including inhalation, direct contact, and ingestion. Exposures may occur indoors and outdoors.
- Current approaches to evaluating health risks are limited and may underestimate the true risks to exposed communities.
- Health effects of exposure will be underestimated unless the potential cumulative impacts of the multiple toxic components of the mixture are considered together.
- Prevention of exposure through better management of the waste is ultimately the most sound public health approach.

Thank you very much for this opportunity to address the Subcommittee.

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Table 1. Health effects of coal combustion waste (CCW) constituents

CCW Constituent	Health Effect(s) of Concern (Exposure by Ingestion)	Information Source
Aluminum	Neurological	ATSDR 2007
Antimony	Longevity, changes in blood glucose and cholesterol	EPA IRIS
Arsenic	Cancer, hyperpigmentation, keratosis of skin	EPA IRIS
Barium	Nephropathy	EPA IRIS
Beryllium	Gastrointestinal	EPA IRIS
Boron	Decreased fetal weight	EPA IRIS
Cadmium	Significant proteinuria	EPA IRIS
Chromium (III)	No effects observed	EPA IRIS
Chromium (VI)	No effects observed	EPA IRIS
Cobalt	Blood	ATSDR 2007
Copper	Gastrointestinal	ATSDR 2007
Fluorine	Cosmetic fluorosis of teeth	EPA IRIS
Iron	NA	NA
Lead	Neurological	CDC 2005
Manganese	Neurological	EPA IRIS
Mercury	Kidney	ATSDR 2007
Molybdenum	Increased uric acid levels	EPA IRIS
Nickel	Decreased body and organ weight	EPA IRIS
Potassium	NA	NA
Selenium	Selenosis – hair and nail loss	EPA IRIS
Silver	Argyria - benign skin pigmentation	EPA IRIS
Strontium	Bone growth and mineralization	EPA IRIS
Thallium	Change in blood chemistry	EPA IRIS
Vanadium	Decreased hair cystine	EPA IRIS
Zinc	Decreased red blood cell copper and enzyme activity	EPA IRIS

Abbreviations: ATSDR, Agency for Toxic Substances and Disease Registry; CCW, coal combustion waste; EPA, Environmental Protection Agency; IRIS, Integrated Risk Information System; NA, not available.

Mr. COSTA. Thank you very much, Dr. Burke. We obviously will get back to you under the question and answer period.

Our next witness is Ms. Lisa Evans, project attorney for Earthjustice.

STATEMENT OF LISA EVANS, PROJECT ATTORNEY, EARTHJUSTICE

Ms. EVANS. Thank you, Mr. Chairman. Thank you, Mr. Chairman.

Mr. COSTA. Do you have your mic activated?

Ms. EVANS. OK. Now I have the button on. Thank you again.

As you noted, I am an attorney for Earthjustice. My area of expertise is hazardous waste law. I have worked previously as an assistant regional counsel for the Environmental Protection Agency. I greatly appreciate the opportunity to testify this morning.

The answer to the question how should the Federal Government address the risks of coal combustion waste is straightforward. Simply stated, EPA must do what it committed to do in its final determination. As the Chairman noted, in 2000 EPA concluded that enforceable Federal regulations are required to protect health and the

environment. In 2000, the National Academies of Science studied the disposal of coal ash in mines and agreed.

Yet some are clamoring now for EPA and OSM to back off. They say things have changed; that Federal regulations are not necessary. I agree. I agree with the proposition that things have changed, but the exact nature of these changes is at the heart of my testimony.

Let us examine what has happened. First, the Clean Air Act has made coal combustion waste more dangerous. Chemicals that harmed human health for years as air pollutants such as mercury, arsenic, lead and thallium now reach us through drinking water from the leaching of coal ash.

Second, the boom in U.S. coal burning is increasing the shear volume of coal combustion waste. Annual generation of waste is expected to top 170 million tons by 2015. The million car train mentioned by Dr. Burke will increase by 300,000 cars by 2015, and Secretary Wilson alluded to the dramatic increase that will occur in that state alone.

Third, cases of water contamination are increasing. EPA recognizes more than double the number of contaminated sites since 2000. Explicitly, 67 cases in 23 states. Last, EPA acknowledges great risk to human health and the environment. In its recent risk assessment EPA found that the risk of cancer from unlined ponds is 900 times greater than its regulatory goals.

In sum, rising toxicity, ballooning volume, increase in contaminated sites and new findings of significant risk reveal that both the threat of harm is increasing and our present system is failing.

In the absence of national standards, widespread damage is occurring. New contaminated sites, not just leftovers, are uncovered with disturbing frequency. Three sites are just a short drive from this room. Consider the Gambrills fly ash site, which Mr. Harvey will talk about in detail.

Also, Secretary Wilson alluded to the Faulkner Landfill in Charles County where coal ash is contaminating a wetland with selenium and cadmium at levels high enough to kill any animal life. Also consider the Battlefield Golf Course in Chesapeake, Virginia, where 1.5 million tons of ash were placed over a shallow aquifer.

Looking further west, consider the Gibson power plant in Indiana where the plant supplies low-income neighbors with bottled water because their water contains boron in levels up to seven times the Superfund removal action level. Also in Indiana consider the town of Pines, now a Superfund site, with no potable well water because coal ash contaminated its aquifer with boron, molybdenum and arsenic.

Finally, consider the lawsuits settled last month at the PPL power plant in Colstrip, Montana, where residents received $25 million after a leaking ash pond poisoned their water. These injuries are entirely avoidable. The bottom line is that the Federal agency charged with protection of our health and environment is not doing nearly enough to prevent irreparable harm.

The solution again is straightforward. EPA must establish minimum safeguards similar to the Federal regulations governing municipal solid waste. For disposal of ash in mines, the National Academies had proposed a clear framework.

The damages from disposal of coal ash may not personally affect many in this room. Low income communities and people of color shoulder a disproportionate share of the risks. The poverty rate of people living within one mile of coal ash sites is twice as high as the national average and the percentage of nonwhite population living within one mile is 30 percent higher. Similar high poverty rates are found in 118 of the 120 coal producing counties where coal ash increasingly is being disposed.

I respectfully ask the Subcommittee to consider the many communities whose water has been poisoned, air fouled and livelihoods threatened. The Office of Surface Mining is currently working on regulations to address the disposal in coal mines. If these regulations fail again to follow the clear recommendations of the National Academies and the lives and resources of coal-filled communities continue to be needlessly threatened, I hope that the Subcommittee will provide a legislative mandate to guarantee those safeguards.

Times have changed, and the need is greater than ever to regulate coal combustion waste. I ask for your help in moving forward to end a crisis borne of Federal inaction.

Thank you very much for your time and your interest on this important issue.

[The prepared statement of Ms. Evans follows:]

Statement of Lisa Evans, Project Attorney, Earthjustice

Chairman Costa and Members of the Subcommittee, thank you for holding this hearing to consider the federal government's role in addressing the health and environmental risks of coal combustion waste. When mismanaged, coal combustion waste damages aquatic ecosystems, poisons drinking water and threatens the health of Americans nationwide. One of the dangers posed by coal combustion waste is disposal in coal mines, a practice that threatens the already heavily impacted communities and natural resources of our nation's coal mining regions.

I am Lisa Evans, an attorney for Earthjustice, a national non-profit, public interest law firm founded in 1971 as the Sierra Club Legal Defense Fund. Earthjustice represents, without charge, hundreds of public interest clients in order to reduce water and air pollution, prevent toxic contamination, safeguard public lands, and preserve endangered species. My area of expertise is hazardous and solid waste law. I have worked previously as an Assistant Regional Counsel for the Environmental Protection Agency enforcing federal hazardous waste law and providing oversight of state programs. I appreciate the opportunity to testify this morning.

The question before this subcommittee, how the federal government should address the risks of coal combustion waste, has a straightforward answer. Simply stated, the U.S. Environmental Protection Agency (EPA) must do what it committed to do in its final Regulatory Determination on Wastes from the Combustion of Fossil Fuels, published 8 years ago.[1] In that determination, mandated by Congress in 1980, EPA concluded that federal standards for the disposal of coal combustion waste under the Resource Conservation and Recovery Act (RCRA) and/or the Surface Mining Control and Reclamation Act (SMCRA) are required to protect health and the environment. EPA's commitment to set minimum federal disposal standards extended to coal ash disposed in landfills, lagoons and mines. Yet eight years later, and 25 years after Congress required this determination, EPA's commitment remains an entirely empty promise.

The failure to fulfill this commitment is wholly unjustified, particularly in light of the substantial research that has already been completed by both EPA and the National Academies of Science (NAS). Preceding EPA's 2000 determination, EPA complied (albeit 16 years late) with a congressional mandate under RCRA to study the risks posed by coal combustion waste, solicit public comment, hold a public hear-

[1] 65 Fed. Reg. 32214, May 22, 2000.

ing, and publish a Report to Congress.[2] As a result, there is a robust record documenting the risks posed by coal ash and the damage that has occurred throughout the country as a result of its mismanagement. Further supplementing the record, EPA published in August 2007 a Notice of Data Availability that included additional documentation of the risks posed by coal combustion waste including a draft Human Health and Ecological Risk Assessment and a Coal Combustion Waste Damage Case Assessment. Lastly, EPA's Office of Research and Development has published a series of documents detailing the increasing toxicity of coal combustion waste, including Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control.

Secondly, in 2004, Representative Nick Rahall introduced legislation requiring the NAS to study the impact of coal ash placement in mines and to recommend what federal action, if any, should be taken to control this burgeoning practice. In March 2006, the NAS published a report, Managing Coal Combustion Residues in Mines, that concluded unequivocally that enforceable federal standards be established to protect ecological and human health. The NAS recommended that EPA and the U.S. Office of Surface Mining (OSM) work together to promulgate federal standards under RCRA, SMCRA or a combination of both statutes.

It is now two years since the publication of the NAS report, 8 years after EPA's final regulatory determination, and 28 years since Congress first asked EPA to study the question. While the federal agencies have failed to act, the need to resolve this question has become increasingly urgent. When one considers the escalating number of sites polluted by coal combustion waste, the documented increase in the toxicity of coal ash, the increase in U.S. coal use, the accompanying increase in the volume of waste, and the trends in mismanagement, the path is clear. Flying blind without federal rules that ensure safe disposal of the largest industrial waste in the country is nothing if not foolish, dangerous, and contrary to statutory mandates and clear Congressional intent.

EPA and OSM are fiddling while ash from burning coal poisons our water and sickens our communities. Inadequate state laws offer scant protection. Federal environmental statutes dictate that EPA and OSM must do what they promised to do and what they have been directed to do—promulgate enforceable minimum federal standards to protect health and the environment nationwide from the risks posed by mismanagement of coal combustion waste.

The Nature of the Threat from Coal Combustion Waste

1. The Volume of Waste is Immense

Burning coal produces over 129 million tons each year of coal combustion waste in the U.S. This is the equivalent of a train of boxcars stretching from Washington, D.C. to Melbourne, Australia.[3] Coal combustion waste (CCW) is largely made up of ash and other unburned materials that remain after coal is burned in a power plant to generate electricity. These industrial wastes include the particles captured by pollution control devices installed to prevent air emissions of particulate matter (soot) and other gaseous pollutants from the smokestack. In addition to burning coal, some power plants mix coal with other fuels and wastes, including a wide range of toxic or otherwise hazardous chemicals, such as the residue from shredded cars (a potential source of PCBs), oil combustion waste (often high in vanadium), railroad ties, plastics, tire-derived fuel and other materials.[4]

As demand for electricity increases and regulations to reduce air emissions from power plants are enforced, the amount of CCW is expected to increase. By 2015, the quantity of CCW generated per year is estimated to exceed 170 million tons. (See Figure 1) In addition, the Energy Information Administration (EIA)'s 2007 Annual Energy Outlook indicates that electricity production from coal is projected to increase almost 25 percent by 2020 and 64% by 2030.[5] Production of CCW will increase proportionally.

CCW is significantly different from coal itself. As coal is burned, its volume is reduced by two thirds to four fifths, concentrating metals and other minerals that re-

[2] U.S. EPA (1999). Report to Congress, Wastes from the combustion of fossil fuels. Volume 2—Methods, findings, and recommendations. Office of Solid Waste and Emergency Response, Washington, DC. EPA 530-R-99-010. March 1999.

[3] U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 3.

[4] U.S. EPA (1999). Report to Congress, Wastes from the combustion of fossil fuels. Volume 2—Methods, findings, and recommendations. Office of Solid Waste and Emergency Response, Washington, DC. EPA 530-R-99-010. March 1999.

[5] Annual Energy Outlook, 2007 with Projections to 2030 (Early Release)- Overview. Report No. DOE/EIA-0383/2007, December 2006.

main in the ash. Elements such as chlorine, zinc, copper, arsenic, selenium, mercury, and numerous other dangerously toxic contaminants are found in much higher concentrations on a per volume basis in the ash compared to the coal. These wastes are poisonous and can cause cancer or damage the nervous systems and other organs, especially in children. The thousands of tons of chemicals disposed of in CCW each year dwarf other industrial waste streams. (See Figure 2) Table 1 below indicates some of the contaminants commonly found in CCW and their human health effects.

Table 1: Human Health Effects of Coal Combustion Waste Pollutants

Aluminum	Lung disease, developmental problems
Antimony	Eye irritation, heart damage, lung problems
Arsenic	Multiple types of cancer, darkening of skin, hand warts
Barium	Gastrointestinal problems, muscle weakness, heart problems
Beryllium	Lung cancer, pneumonia, respiratory problems
Boron	Reproductive problems, gastrointestinal illness
Cadmium	Lung disease, kidney disease, cancer
Chromium	Cancer, ulcers and other stomach problems
Chlorine	Respiratory distress
Cobalt	Lung/heart/liver/kidney problems, dermatitis
Lead	Decreases in IQ, nervous system, developmental and behavioral problems
Manganese	Nervous system, muscle problems, mental problems
Mercury	Cognitive deficits, developmental delays, behavioral problems
Molybdenum	Mineral imbalance, anemia, developmental problems
Nickel	Cancer, lung problems, allergic reactions
Selenium	Birth defects, impaired bone growth in children
Thallium	Birth defects, nervous system/reproductive problems
Vanadium	Birth defects, lung/throat/eye problems
Zinc	Gastrointestinal effects, reproductive problems

2. Better Air Pollution Controls Make CCW More Toxic

CCW is becoming increasingly toxic. As air pollution control regulations are implemented under the Clean Air Act, more particulates and metals are captured in the ash instead of being emitted from the smokestack. In a 2006 report on CCW, EPA found that when activated carbon injection was added to a coal-fired boiler to capture mercury, the resulting waste leached selenium and arsenic at levels sufficient to classify the waste as "hazardous" under RCRA.[6] Specifically, EPA found that arsenic leached (dissolved) from the CCW at levels as high as 100 times its maximum contaminant level (MCL) for drinking water, and selenium leached at levels up to 200 times its MCL.[7]

In a follow-up study that is currently underway by EPA's Office of Research and Development, EPA tested the leaching characteristics of CCW from a power plant employing both mercury controls and a wet scrubber for sulfur dioxide control. EPA found that CCW from a plant with a wet scrubber leached numerous additional toxic metals at levels significantly higher than their MCLs.[8] EPA found that the CCW leached arsenic, thallium, boron, and barium above RCRA's hazardous waste threshold (100 times the MCL). The CCW also leached levels of antimony, cadmium, chromium, lead, mercury, molybdenum and selenium in quantities sufficient to contaminate drinking water and harm aquatic life.

EPA's own analyses of how CCW behaves in unlined disposal sites predict that some metals will migrate and contaminate nearby groundwater to conditions extremely dangerous to people. In 2007, EPA published a draft Human Health and Ecological Risk Assessment that found extremely high risks to human health from the disposal of coal ash in waste ponds and landfills. According to EPA, the excess cancer risk for children drinking groundwater contaminated with arsenic from CCW disposal in unlined ash ponds is estimated to be as high as nine in a thousand—900 times higher than EPA's own goal of reducing cancer risks to less than one-

[6] U.S. EPA (2006). Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control. EPA/600/R-06/008. (January).

[7] Ibid.

[8] U.S. EPA, Office of Research and Development. "Evaluating the Fate of Metals from Management of Coal Combustion Residues from Implementation of Multi-pollutant Controls at Coal-fired Electric Utilities," Presentation for 32nd Annual EPA-A&WMA Information Exchange. December 4, 2007.

in-one hundred thousand individuals. Figure 3 compares EPA's findings on the cancer risk from arsenic in coal ash disposed in waste ponds to several other cancer risks, along with the highest level of cancer risk that EPA finds acceptable under current regulatory goals.

Clearly, as new technologies are mandated to filter air pollutants from power plants, cleaning the air we breathe of smog, soot and other harmful pollution, the quantity of dangerous chemicals in the ash increases. Without adequate safeguards, the chemicals that have harmed human health for years as air pollutants- mercury, arsenic, lead and thallium- will now reach us through drinking water supplies. Given the documented tendency of CCW to leach metals at highly toxic levels, there is clearly the need for scrutiny of current disposal practices.

3. CCW Causes Documented Damage to Human Health and the Environment

The absence of national disposal standards has resulted in environmental damage at disposal sites throughout the country. In fact, scientists have documented such damage for decades. Impacts include the leaching of toxic substances into soil, drinking water, lakes and streams; damage to plant and animal communities; and accumulation of toxins in the food chain.[9], [10] According to EPA's latest Damage Case Assessment for Coal Combustion Waste published in 2007, EPA recognizes 67 contaminated sites in 23 states where CCW has polluted groundwater or surface water. EPA admits that this is just the tip of the iceberg, because most CCW disposal sites in the U.S. are not adequately monitored.

Low-income communities and people of color shoulder a disproportionate share of the health risks from these wastes. The poverty rate of people living within one mile of coal combustion waste disposal sites is twice as high as the national average, and the percentage of non-white populations within one mile is 30 percent higher than the national average. Similarly high poverty rates are found in 118 of the 120 coal-producing counties, where CCW increasingly are being disposed of in unlined, under-regulated mines, often directly into groundwater.

Documented damage from CCW includes:

- Public and private drinking water contaminated by CCW in at least 8 states, including Wisconsin, Illinois, Indiana, New Mexico, Pennsylvania, North Dakota, Georgia and Maryland.[11]
- Hundreds of cattle and sheep killed and many families sickened in northern New Mexico by ingesting water poisoned by CCW.[12]
- Fish consumption advisories issued in Texas and North Carolina for water bodies contaminated with selenium from CCW disposal sites and entire fish populations destroyed.[13], [14]
- Documented developmental, physiological, metabolic, and behavioral abnormalities and infertility in nearly 25 species of amphibians and reptiles inhabiting wetlands contaminated by CCW in South Carolina.[15]

Unfortunately, new CCW-contaminated sites are being uncovered with disturbing frequency. One need only pick up the Washington Post, Baltimore Sun or Virginian-Pilot over the last few months to grasp the national crisis. Evidence of poisoned water has recently surfaced in Baltimore, Charles County, Virginia Beach, and across the country in Illinois, Indiana, and Montana.

The following sites are illustrative:

- Gambrills Fly Ash Site, Anne Arundel County, Maryland where 3.8 million tons of ash were dumped in unlined gravel pits contaminating drinking water wells with arsenic, lead, cadmium, nickel, radium and thallium as high as 4 times the drinking water standard.

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[9] Adriano, D.C., Page, A.L., Elseewi, A.A., Chang, A.C., Straughan, I.R. (1980).Utilization and disposal of fly ash and other coal residues in terrestrial ecosystems. Journal of Environmental Quality, 9: 333.

[10] Carlson, C.L., Adriano, D.C. (1993). Environmental impacts of coal combustion residues. Journal of Environmental Quality, 22: 227-247.

[11] Cherry, D.S. (1999). A review of the adverse environmental impacts of coal combustion wastes. Prepared for the Hoosier Environmental Council, November 10, 1999.

[12] Taugher, Mike. Water Worries & Shumway Arroyo Was At Center of 1980s Lawsuits, Albuquerque Journal, A1 & A10, October 24, 1999.

[13] Skorupa, Joseph, P. (1998). Selenium poisoning of fish and wildlife in nature: Lessons from twelve real-world examples, from Environmental Chemistry of Selenium. Marcel Dekker, Inc. New York.

[14] Cherry, D.S. (1999). A review of the adverse environmental impacts of coal combustion wastes. Prepared for the Hoosier Environmental Council, November 10, 1999

[15] Hopkins, W.A., C.L. Rowe, J.H. Roe, D.E.Scott, M.T. Mendon'a and J.D. Congdon, (1999). Ecotoxicological impact of coal combustion byproducts on amphibians and reptiles. Savannah River Ecology Laboratory, presented at the Society for Environmental Toxicology and Chemistry, 20th Annual meeting, Philadelphia, PA, November 14-18. Abstract # PMP009.

- Faulkner Landfill, Charles County, Maryland where leaching coal ash is contaminating a wetland with selenium and cadmium at levels high enough to kill any animal life, The Smithsonian Institution has called the affected wetlands, Zekiah Swamp, one of the most ecologically important areas on the East Coast.
- Battlefield Golf Course, Chesapeake, Virginia where developers used 1.5 million tons of fly ash to build a golf course over a shallow aquifer. Although the course was just completed this winter, wells are already starting to show elevated boron. Investigation into the cause of the pollution has just begun. Residential drinking water wells are in close vicinity to the unlined, uncapped site.
- PPL Montana Power Plant, Colstrip, Montana, the second largest coal-fired power plant west of the Mississippi, where leaking unlined coal ash ponds contaminated residential wells with high levels of metals, boron and sulfate. Five companies agreed in May 2008 to pay $25 million to settle a groundwater contamination lawsuit brought by residents.
- Gibson Generating Station, Gibson County, Indiana where enormous ash ponds are exposing threatened species to dangerous levels of selenium and where the power company supplies residents with bottled water because their wells are contaminated with boron.

These injuries to human lives and the environment are entirely avoidable. Yet damage will continue to occur at site after site in the absence of minimum federal standards. As you read this testimony, approximately 1000 tons of ash is disposed daily into a New Mexico mine, although the mine continues to leach toxic levels of sulfate into scarce New Mexico waters. Constellation Energy, the company that poisoned the water in Gambrills, Maryland and paid a million dollar fine for that offense, is today seeking to dump its ash into another unlined Maryland quarry because there are no state laws prohibiting the dumping. And currently there is a permit pending in Pennsylvania that seeks to create the largest unlined coal ash dump in the U.S. in a surface coal mine without any requirements for sufficient monitoring, waste or site characterization, cleanup standards, or bonds for cleanup. The damage that will result from these acts is not inevitable. It is within this subcommittee's power to require federal agencies to do their job to protect health and the environment from this toxic waste.

4. CCW is Disposed in Coal Mines without Safeguards

Each year, approximately 25 million tons of CCW, nearly 20% of total CCW generation, are placed in active and abandoned coal mines without basic safeguards to protect health and water resources. Under pressure from electric utilities, many states have wrongly defined the dumping of CCW in coal mines as a "beneficial use" and exempted the practice from all solid waste regulations.[16] Consequently, enormous quantities of CCW are being dumped directly into groundwater without any monitoring or clean up requirements.

The laissez faire regulatory approach of many states to CCW minefilling maximizes the risk of contamination. Mining breaks up solid rock layers into small pieces, called spoil. Compared to the flow through undisturbed rock, water easily and quickly infiltrates spoil that has been dumped back into the mined out pits. Fractures from blasting and excavation become underground channels that allow groundwater to flow rapidly offsite. Because mines usually excavate aquifers (underground sources of water), the spoil fills up with groundwater. Unlike engineered landfills, which are lined with impervious membranes (clay or synthetic) and above water tables by law, ash dumped into mine pits continually leaches its toxic metals and other contaminants into the water that flows through and eventually leaves the mine.

In fact, serious contamination has been documented at numerous mine sites across the country where CCW has been disposed. In a multi-year study of 15 coal ash minefills in Pennsylvania, researchers found that CCW made the water quality worse at 10 of the 15 mines.[17] At five of the sites, there was not enough monitoring data to determine whether adverse impacts were caused by the CCW. A review of the permits revealed that:

- Levels of contaminants, including manganese, aluminum, arsenic, lead, selenium, cadmium, chromium, nickel, sulfate and chloride, increased in groundwater and/or surface water after CCW was disposed in the mines.
- Contaminants increased from background concentrations (measured after mining) to levels hundreds to thousands of times federal drinking water standards.

[16] U.S. EPA (2002). Mine Placement of Coal Combustion Waste, State Program Elements, Final Draft, December 2002.

[17] Clean Air Task Force, Impacts of Waster Quality from Placement of Coal Combustion Waste in Pennsylvania Coal Mines, September 2007. Pages 26-38.www.catf.us

- Pollution was found downstream from CCW disposal areas and sometimes well outside the boundary of the mines.

Even though the placement of coal ash in coal mines is often touted as a "beneficial use" for the purpose of treating acid mine drainage, the facts show that minefilling is not an effective solution. While the CCW remediated acid mine drainage temporarily in a few of the mines studied, in two thirds of the mines, the introduction of CCW resulted in more severe, long-term contamination than had existed at these sites from the mining operation itself. Furthermore, the stakes are high if contamination occurs. As a practical matter, dumping large quantities of CCW directly into water tables at highly fractured sites under massive quantities of mine overburden makes the prospect of cleaning up contamination far more daunting than halting leakages from conventional landfills and ash ponds.

5. States Fail to Provide Adequate Regulation of CCW Disposal

With no minimum federal standards, the states have been free to regulate as they please, or more often, abstain from effective regulation altogether. If one compares how EPA regulates the disposal of ordinary household trash with its hands-off approach to CCW, the results defy logic. While newspapers, soda cans and banana peels under no circumstances qualify as RCRA hazardous waste, EPA has established detailed federal disposal standards for the landfills that contain them.[18] Household trash cannot be dumped in a mine without violating federal law, but in most states battleship quantities of metal-laden ash can be dumped with relative impunity. EPA has regulations governing all aspects of the disposal of household trash in landfills including performance standards, siting restrictions, monitoring, closure requirements, bonding, and post-closure care.[19] These regulations, promulgated under subtitle D of RCRA, are enforceable by states and citizens against any owner or operator of a landfill in violation of the standards. Furthermore, RCRA requires that state solid waste programs promulgate equivalent (or more stringent) regulations in order to maintain authorization.[20] Yet EPA has no such regulations for the disposal of toxic ash that exceeds hazardous waste levels for toxic metals. The result is an inconsistent patchwork of largely inadequate state regulation.

The utility industry, as well as some states, claim that the states are doing a good job of regulating coal ash despite the absence of federal standards. The fact that EPA admits at least 67 sites in 23 states have been contaminated by CCW indicates that the opposite is true. A survey of state laws governing CCW disposal in landfills and surface impoundments shows that state regulations fall short of requiring measures that would adequately protect human health and the environment. Earthjustice, along with several other environmental organizations, submitted analyses of the laws and regulations of 20 states in response to EPA's Notice of Data Availability in February 2008. Our state survey is too voluminous to repeat in this testimony, but the analyses show definitively that state solid waste programs do not provide consistent and adequate safeguards sufficient to protect human health and the environment from CCW. Most states failed to require the basic safeguards essential for waste management, including liners, leachate collection systems, groundwater monitoring, corrective action (cleanup), closure and post-closure care.

In fact, the gaps are shocking. Among the top 15 CCW generating states, which represent 74% of U.S. CCW generation, only one state requires all CCW lagoons (surface impoundments) to be lined and only one state requires all CCW lagoons to monitor groundwater for migrating pollutants. Only three states out of 15 require CCW landfills to be lined. It is not surprising, therefore, that EPA reported in 2000 that only 57 percent of CCW landfills and only 26% of CCW surface impoundments were lined and that only 65% of landfills and 38% of surface impoundments conducted groundwater monitoring.[21]

In addition, in 2005, a report prepared for EPA's Office of Solid Waste, entitled Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities Under Part 258, included a survey on state disposal regulations that verified that states fail to prohibit the most dangerous CCW disposal practices. The report examined the top 25 coal-consuming states to determine how much CCW is prohibited from disposal below the natural water table. Since isolation of ash from water is critical to preventing toxic leachate, it is axiomatic that disposal of ash must occur above the water table. Yet the report found that only 16% of the total waste volume being regulated by these 25 states is prohibited from

[18] See 40 C.F.R. Part 258.
[19] Ibid.
[20] 42 U.S.C. § 6947.
[21] US EPA. Regulatory Determination on Wastes from the Combustion of Fossil Fuels, 65 Fed. Reg. 32214 at 32216, May 22, 2000.

disposal in water when waste is disposed in surface impoundments. For landfills, the total waste volume that is prohibited from disposal in water is only 25%. Thus the great majority of total CCW produced in those states is allowed to be disposed into the water table, namely 84% of the total volume of CCW disposed in surface impoundments and 75% of the total volume disposed in landfills.[22]

In view of EPA's risk assessment that finds the cancer risk from ash ponds 900-times EPA's regulatory goals, the absence of basic monitoring, lining and isolation requirements at the nation's roughly 300 CCW surface impoundments is alarming. Failure to impose requirements at waste lagoons is particularly dangerous, because CCW disposed in surface impoundments is intentionally mixed with water to create a sludge. The presence of water facilitates the dissolution and migration of pollutants, particularly when the ash pond is unlined or lined with only soil or clay. As the above statistics reveal, lining and monitoring does occur at some CCW disposal units, but far too much is left to the discretion of state regulators and the whim of individual utilities.

A 2005 report published jointly by EPA and the U.S. Department of Energy (DOE), entitled "Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004, attempted to show that certain industry practices have improved since EPA's regulatory determination. The report was based primarily on data voluntarily submitted by the utility industry. The report surveyed 56 permitted landfills and surface impoundments built between 1994 and 2004. The report cited the presence of "liners" at all newly permitted surface impoundments and landfills and concluded "[t]he use of liners has become essentially ubiquitous." This conclusion, however, is grossly misleading, because the devil is in the details. While more liners appear to be installed on disposal units built in the last decade, the type of liners is insufficient to protect health and the environment.

In fact, the DOE/EPA Report reveals that only 39% of the units, at best, installed composite liners. According to EPA's 2007 draft Human and Ecological Risk Assessment, landfills and surface impoundments with clay liners do not provide adequate protection of health and the environment. EPA's Risk Assessment states:

> Risks from clay-lined units are lower than those from unlined units, but 90th percentile risks are still well above the risk criteria for arsenic and thallium for landfills and arsenic, boron and molybdenum for surface impoundments.[23]

The Risk Assessment further states that composite liners effectively reduce risks from all constituents to below the risk criteria for both landfills and surface impoundments. A composite liner is defined as a high-density polyethylene (HDPE) membrane combined with either geosynthetic or natural clays. Yet the DOE/EPA Report reveals that clay liners were used at 25% of the permitted units. Single liners, also deemed inadequate, were used at 18% of the surveyed units. Thus it is clear that the majority of new units do not have adequate liners. Unless the liner is of a sufficient quality to prevent the migration of contaminants, its use is largely irrelevant. The DOE/EPA Report's updated survey of state-permitted disposal units does not show that adequate protections are in place. Conversely, it reveals that the absence of a federal rule requiring composite liners has produced a whole new generation of waste units in at least a dozen states that pose serious threats to human health and the environment.

Furthermore, the 2005 DOE/EPA Report documents that nearly a third of the net disposable CCW generated in the U.S. are potentially totally exempt from solid waste permitting requirements.[24] The DOE/EPA Report explains this fact in great detail:

> [t]he six States that have solid waste permitting exemptions for certain on-site CCW landfills generated a total of approximately 17 million tons of net disposable CCWs in 2004, which is 20% of the total net disposable CCWs generated for all States. The one State that excludes CCW from all solid waste regulations, Alabama, generated a total of approximately 2.7 million tons of net disposable CCWs in 2004, which is about 3.3% of the total net disposable CCWs generated in all States. Ohio, which excludes "nontoxic" fly ash, bottom ash, and boiler slag from solid waste regulations, generated a total of 5.9 million tons of these wastes and 1.1 million tons of FGD wastes (about 7 million tons total) in 2004. Of these amounts, about 1.3

[22] DPRA Incorporated. Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities under Part 258, prepared for U.S. EPA, Office of Solid Waste, November 30, 2005 at page 39.

[23] US EPA, Hunan and Ecological Risk Assessment at ES-7.

[24] U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 45.

> million tons of "nontoxic" fly ash, bottom ash, and boiler slag are beneficially used and about 1 million tons of FGD sludge are beneficially used. Hence, the net disposable CCWs that were potentially exempt from solid waste permitting requirements in Ohio in 2004 ". amount to about 4.6 million tons. ". Thus the amount of net disposable CCWs in Ohio that is potentially exempt from solid waste permitting requirements represents about 5.4% of the total net disposable CCWs generated for all States. **Overall, the portion of the net disposable CCWs that is potentially exempt from solid waste permitting requirements is approximately 24 million tons, which corresponds to 29% of the total net disposable CCWs generated in the United States during 2004.**[25] (Emphasis added).

The report also explains that this exempted CCW represents almost a third of the U.S. coal-fired generating capacity:

> In terms of electric generating capacity, the six States that have solid waste permitting exemptions for certain on-site CCW landfills generated a total of approximately 66,000 MW, which is approximately 20% of the total coal-fired electric generating capacity in the United States in 2004. The one State the excluded CCWs from all solid waste regulations, Alabama, generated a total of approximately 12,000 MW in 2004, which is about 3.7% of the total. Ohio which excludes "nontoxic" fly ash, bottom ash and boiler slag from solid waste regulations, generated a total of about 24,000 MW in 2004. This represents about 7.2% of the total coal-fired electric generating capacity in the United States. **Overall, the portion of the coal-fired electric generating capacity in the States that potentially exempt CCW landfills from solid waste permitting requirements and that exclude certain CCWs from all solid waste regulation is approximately 102,000 MW, which corresponds to about 30% of the total coal-fired electric generating capacity in the United States in 2004.**[26] (Emphasis added.)

Thus the DOE/EPA Report demonstrates that a significant portion of the CCW generated in the U.S. is potentially not subject to any solid waste permitting. This is another wholly unacceptable gap in regulation of CCW that is likely to have significant negative impact on health and the environment.

6. Voluntary Industry Agreements are not a Solution

It is not viable to allow the utility industry to police itself. The proliferation of contaminated sites over the last 8 years demonstrates that industry is not voluntarily ensuring safe disposal. A voluntary agreement recently signed by some utilities and presented to EPA as a substitute for enforceable regulations is unacceptable.[27] Its shortcomings are too numerous to describe here in detail, but suffice it to say that the utilities are proposing substantially less protection for their toxic ash than is required by law for the garbage from their cafeterias.

The voluntary industry agreement is designed to allow the electric utility industry to continue avoiding the cost of safe disposal of its voluminous waste. The plan intentionally fails to require monitoring that would detect pollution escaping CCW surface impoundments and landfills or to require any specific response should pollution be detected. The plan fails to require the most basic of safeguards, composite liners, and it fails to prohibit the placement of CCW directly into groundwater, and nothing in the plan applies to disposal of CCW in mines. In view of continuing damage from coal ash, the hundreds of disposal units operated by industry today without safeguards, and the clear direction provided by Congress, the Clinton EPA and the National Academies of Science, it is untenable for any federal agency to entertain an unenforceable, voluntary proposal.

7. EPA Fails to Fulfill the Statutory Mandates of RCRA

The goal of RCRA is to ensure the safe disposal of solid and hazardous waste and to encourage the safe reuse of waste in order to protect human health and the environment and conserve the nation's natural resources.[28] By failing to make good on its promise to promulgate minimum federal standards, EPA has failed in both respects. The disposal of CCW without safeguards has resulted in the creation of "open dumps," as they are defined in 40 C.F.R. Part 257, which is specifically pro-

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[25] Ibid.

[26] Ibid. at 45-46.

[27] Utility Solid Waste Activities Group. Utility Industry Action Plan for the Management of Coal Combustion Products.

[28] 42 U.S.C. § 6902.

hibited by the statute.[29] Furthermore, because disposal of CCW in unlined, unmonitored pits so frequently presents the threat of an imminent and substantial endangerment to health or the environment, these disposal units violate RCRA's core statutory mandate that disposal of solid waste avoid the potential for substantial damage, as set forth in section 7003 of RCRA.[30] Furthermore, Section 1008 of RCRA requires EPA to "develop and publish suggested guidelines" for solid waste management under subtitle D, as necessary to ensure protection of public health and the environment. Thus EPA has failed with regard to CCW, not only to abide by its own regulatory determination, but also to comply with the mandates of RCRA.

Further, by failing to impose disposal standards, EPA fails to encourage CCW reuse. When cheap dumping is no longer available, power plants will have far greater incentive to recycle their ash. Reuse of ash as a component of asphalt, concrete, and gypsum board are legitimate and safe reuses that should be encouraged. In addition, recycling ash in concrete can result in a large reduction of greenhouse gases. Approximately one ton of CO_2 is released for every ton of Portland cement produced, but certain fly ashes can replace up to 50% by mass of Portland cement.[31] Further, since cement kilns are one of the largest emitters of mercury in the nation, the reduction of Portland cement production will reduce mercury emissions.

The Federal Solution

The solution is straightforward. EPA, or in the case of CCW disposal in mines, OSM, in conjunction with EPA, must provide minimum enforceable safeguards for the disposal of CCW in mines, landfills and waste lagoons. This is not a novel concept. These regulations can be similar to the regulations governing municipal solid waste landfills. For coal ash landfills, it is a simple matter to require the basics: placement above the water table, composite liners, groundwater monitoring, daily cover of the waste, cleanup standards if contamination is discovered, construction of a cap upon closure, financial assurance, and post-closure care. In fact, a coalition of environmental groups, including Earthjustice, submitted draft regulations to EPA almost 18 months ago. EPA never responded.

For disposal of coal ash in mines, the National Academies of Science established a clear framework for federal regulations in their 2006 report, recommending waste and site characterization, isolation from groundwater, effective monitoring, site specific management plans, adequate bonding, public participation in permitting, and site specific cleanup standards. Again, these basic safeguards are the familiar foundation of federal waste disposal law.

Recommendations

Many complicated environmental issues have been brought before this committee, but the instant question is not one of them. Clear solutions exist and have already been identified. Research and analysis conducted by EPA, the Science Advisory Board, and the National Academies of Science indicate a high and unacceptable risk from CCW when the waste is disposed without safeguards. The threat is not theoretical. Case after case of serious injury to health and the environment has resulted from unsafe disposal of CCW.

It is thus our hope that the Subcommittee will recommend that EPA and OSM take the following steps to protect our communities and environment from the risks posed by CCW.

1. A timetable is needed for establishing federal regulations.

For landfills and surface impoundments, EPA must immediately begin to formulate the basic minimum waste management requirements that will be required at all surface impoundments and landfills.

For standards applicable to mines, EPA should work closely with OSM. As necessary, RCRA authority must extend to waste disposal in mines, if it is found that SMCRA authority is not sufficient. Use of EPA's extensive expertise in waste management is essential to the development of effective and comprehensive waste disposal rules for mines, whether the regulations are promulgated under RCRA or SMCRA. EPA's decision to defer entirely to OSM and its consequent failure to work

[29] 42 U.S.C. § 6945(a).

[30] 42 U.S.C. § 6973.

[31] http://www.us-concrete.com/news/features.asp (last checked June 1, 2008) In Wisconsin, for example, adequate regulation of CCW has raised recycling rates significantly. Wisconsin CCW regulations are probably the most comprehensive in the nation. As a result, the recycling rate in Wisconsin for CCW is 85%, more than double the average recycling rate for all other CCW-producing states (36%).[1] It stands to reason that if the true cost of disposal were borne by electric utilities, there would be far greater incentive to find beneficial uses for the ash.

closely with OSM to ensure the quality of minefilling regulations is totally unacceptable.

In view of EPA's longstanding failure to abide by its 2000 commitment to promulgate regulations and the harm that is currently occurring because of EPA's failure to act, it is necessary to ensure that the agency is indeed moving forward to establish federal standards. Further action by this Subcommittee to conduct additional hearings and support legislation to set a deadline for federal action would be extremely helpful.

2. EPA and OSM must promulgate federal regulations, not guidance.

We ask the Subcommittee to ensure that EPA and OSM establish regulations, not guidance, governing CCW disposal. Promulgation of federal regulations is absolutely essential, because many states cannot enact CCW disposal safeguards in the absence of federal standards. Some 23 states have "no more stringent" provisions in their statutes that prohibit the states from enacting stricter standards than are found in federal law. Thus for those states, without federal regulation, there can be no regulation of CCW beyond what few safeguards there are now.[2] Among states with "no more stringent provisions" are Colorado, Kentucky, Montana, New Mexico, Tennessee and Texas. While agency guidance is a useful tool to direct the implementation of enforceable regulations, it is not an acceptable substitute for a federal rulemaking.

3. EPA should phase-out surface impoundments (waste ponds) at existing coal-fired plants and prohibit the construction of surface impoundments at new plants.

EPA should prohibit construction of surface impoundments at all new coal-fired plants and require a phasing-out of surface impoundments at existing plants. Electric utilities have a choice of producing dry or wet waste, and given the evidence of damage to human health and the environment from disposal of slurried (wet) ash in waste ponds, an essential and important step to improve waste management over the long term is to require utilities to move toward dry disposal of CCW. The dozens of cases of contamination from the leaching of arsenic and other pollutants from surface impoundments across the U.S. is testament to the danger of wet disposal. As described in this testimony, EPA's 2007 draft Human and Ecological Risk Assessment of Coal Combustion Wastes identifies exceedingly high risks of groundwater contamination from CCW surface impoundments and finds that the risk from surface impoundments is considerably higher than the risk from CCW landfills. Isolation of CCW from water is unquestionably the safest way to dispose of ash. A prohibition on new surface impoundments would greatly reduce the risk of new cases of poisoning and would ensure that waste management practices at the numerous new coal plants coming on line reflect our scientific knowledge. This prohibition would guarantee long-term protection because CCW waste units, particularly surface impoundments, are routinely used for several decades. Communities living near coal-fired power plants deserve protection from this wholly avoidable threat to their health and environment. For existing plants, EPA should establish reasonable date for termination of all wet-waste disposal. As an added benefit, disposing of dry ash in landfills preserves the ash for recycling at a later date.

4. EPA should prohibit disposal of CCW in sand and gravel pits.

In view of the clear threat to public health posed by disposal of CCW in sand and gravel pits, we ask this Subcommittee to recommend an immediate prohibition. Since 2000, EPA has recommended that CCW disposal in sand and gravel pits be terminated because of the many damage cases resulting from this practice. Recently, CCW disposed in an unlined pit caused serious contamination of drinking water at the Gambrills site in Maryland. The threat to public health posed by the recent dumping (1999 through 2007) is unconscionable, considering EPA's long experience with cases of water contamination from this disposal practice. EPA has long acknowledged numerous proven damage cases caused by CCW disposal in sand and gravel pits, including sites that poisoned or threatened public drinking water supplies in Massachusetts, Virginia, and three sites in Wisconsin. A prohibition is necessary because this dangerous mode of disposal is still an acceptable practice in numerous states. In fact, Iowa currently has at least four ongoing disposal operations in unlined sand and gravel pits. Once again, EPA's scientific findings must be applied in a timely way to prevent future harm. In view of CCW's propensity to leach into aquifers from sand and gravel pits and the likely paths of migration to residential areas and public water supplies, it is necessary to act immediately to avoid further injury.

5. EPA should reject voluntary industry proposals as a substitute for regulation.

EPA must not consider a voluntary plan proposed by the utility industry as a substitute for regulations. If the utility industry is interested in moving forward with waste management improvements prior to EPA's adoption of regulations, that is commendable. Under no circumstances, however, should EPA consider such voluntary measures an acceptable substitute for national regulation.

Conclusion

In conclusion, Mr. Chairman, Representative Pearce and Members of the Subcommittee, Earthjustice asks the Subcommittee to ensure the promulgation of science-based, minimum federal standards, the hallmark of EPA's waste management program, to address the threat posed by coal combustion waste disposal. EPA and the National Research Council recognize, as does Congress, that mismanagement of CCW causes serious injury to public health and the environment. Maintenance of the status quo ensures that further damage will occur.

A great number of communities in the U.S. are concerned about this issue. OSM's Advanced Notice of Proposed Rulemaking on the Placement of Coal Combustion Byproducts in Active and Abandoned Coal Mines drew over 4,000 comments from citizens last June, and over 10,000 individuals responded to EPA's Notice of Data Availability on Coal Combustion Wastes in February 2008. Communities threatened by the disposal of coal ash are requesting that minimum standards be put in place as soon as possible. These communities, often poor and already fighting environmental threats from other sources, need to be protected from damage that is wholly preventable.

In its final Regulatory Determination on Wastes from the Combustion of Fossil Fuels, EPA determined that the cost to industry of compliance with tailored hazardous waste regulations would be "only a small percentage of industry revenues."[3] EPA estimated this cost to be "less than 0.4 percent of industry sales."[4] Today, EPA is considering regulating CCW under solid waste authority, not under the far more costly subtitle C requirements of RCRA. Thus in 2005, EPA recalculated the cost to industry in its report, Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities Under Part 258. EPA concluded that compliance with non-hazardous solid waste regulations would be less than half of the cost of compliance with hazardous waste rules.[5] Thus the cost of safe disposal is not burdensome to industry, although it has proved, at site after site, to be catastrophic to the public and the environment.

In sum, I greatly appreciate the Subcommittee's interest in the risk of harm posed by CCW and how this problem can be solved by our federal agencies. Thank you again, Mr. Chairman, for the opportunity to present to you and the Subcommittee information about this critical issue.

Figure 1

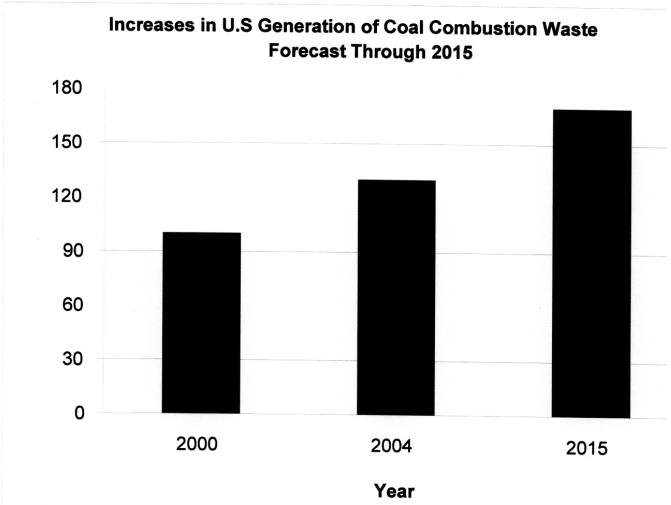


Figure 2

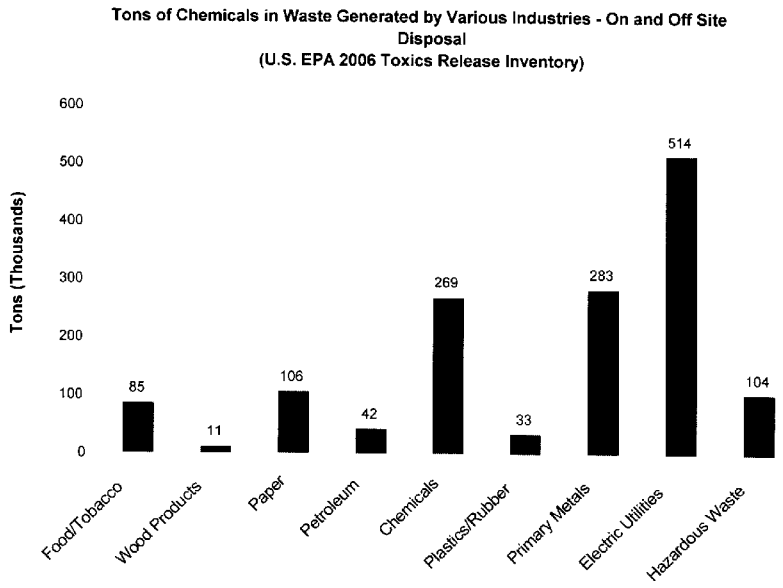
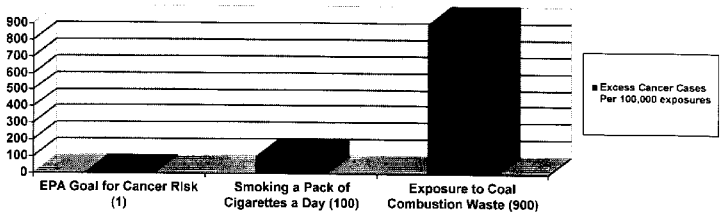


Figure 3



Mr. COSTA. Thank you very much. We appreciate your testimony and look forward to having an opportunity to get to the questions.

Our next witness is Mr. Norman Harvey, who is a community activist in Maryland. We appreciate, Mr. Harvey, your ability to be here this morning and to testify before the Subcommittee.

STATEMENT OF NORMAN HARVEY, President, GREATER GAMBRILLS IMPROVEMENT ASSOCIATION

Mr. HARVEY. Thank you. Thank you, Mr. Chairman. I would like to thank you and the Subcommittee for my appearance today, as well as Congressman Sarbanes for his public interest in health issues in particularly the Gambrills area.

What I would like to show you today if I can is the site map as you see it up here on the screen, the particular area where I live,

and I am speaking specifically of the Turner Pit as well as the Waugh Chapel Pit.

Historically across the Nation and particularly in underrepresented areas, large waste producing corporations have sought old mining shafts and abandoned mines for fly ash disposal sites with little or no regard for public safety. I contend that the problem does not lie primarily with the waste product, but the lack of proper safeguards and poorly regulated controls and ordinances.

In 1993, I would like to show you the open fields that are next there. Those are the open fields. Those are the cells in the Gambrills area where they have produced and dumped coal ash deposits. I can elaborate on that more fully in the answer, the time and answer period.

In 1993, EPA, under the Federal Resource Conservation and Recovery Act, made the determination that it would no longer regulate coal combustion waste as a hazardous waste. In doing so, I want to show this slide for the dust pollution that has come off the site, as well as the dust storms that have polluted the Gambrills area.

As you can see there, there are two trucks in the foreground, but there are dust screens that have caught up the particles from the open cells that are consistently open in this area for any length of time. The cell itself can be as large as a half acre to an acre before they cover it up with any type of soil.

In 1995, and I want to go back to the slide. In 1995, Constellation Energy, in partnership with BBSS, Inc., better known as Reliable Contractors, commenced depositing fly ash into a 63 acre site known as the Turner Pit, as you see there, not more than one-half mile from my community, under the guise of reclamation, but their real motive was profit.

According to MDE, approximately two million tons of coal ash, which is heavier than fly ash, is captured at this site every year and is generated each year in the State of Maryland. To date, more than 3.8 million tons of this highly toxic CCB have been dumped into the Turner Pit without adequate protective devices in place such as liners and leachate collecting systems. In addition, the operators have neglected early warning signals from monitoring wells.

State and county officials were well aware of the probability of groundwater contamination due to earlier contamination of the Brandon Woods/Solley Road residential community seven years earlier. The Turner Pit was approved by MDE just as the Brandon Woods project with the knowledge that severe groundwater and aquifer contamination was an immediate threat of endangering the health of its citizens.

In June of 1999, MDE was made aware of groundwater and aquifer contamination above the 500 milligrams per liter permit limit for sulfates. MDE and the county health officer allowed continued operations, disregarding public health threats to the Evergreen and Waugh Chapel communities. Had a specific analysis been conducted prior to commencing operations and the prior knowledge of the Brandon Woods/Solley Road disaster, this second incident would never have been in effect.

In 2000, MDE allowed special exceptions for extending the operation to an adjacent pit known as the Waugh Chapel Pit, disregarding specific findings and knowledge of leachate contamination at the first site, including airborne contamination that I showed you earlier of fly ash particles. It has been estimated that these sites have generated more than $15 million profit in taxes, permits and fees for Constellation Energy.

In October of 2006, and I am skipping here for the sake of time, test wells indicated 4,480 milligrams per liter at the Waugh Chapel site, and operations were allowed to continue under existing MDE and county scrutiny.

I might say here that a lot of the residents, Mr. Chairman, were forced to hook garden hoses and PVC pipes onto fire hydrants for water during the winter. In addition, they are currently being furnished 12 ounce bottled water by Constellation Energy.

In 2007, according to a report by the Maryland Department of Natural Resources, 34 residential wells were contaminated with toxic elements, including arsenic, lead and cadmium, at levels as high as three times higher than EPA's maximum standard for safe drinking water.

In September 2007, Constellation Energy voluntarily stopped dumping under a consent decree after the site had been 90 percent filled, but residents are still on bottled water, so it is a grave concern to myself and a lot of the other residents in the community as to the impact this coal ash has had on our lives, our homes and our lifestyles, even the children as far as air pollution of contaminants of fly ash.

So, in closing, I want to thank you very much. There is much more, but I thank you for the time that I have been permitted to give you just a small overview of the impact that this has had on the residents of Evergreen and the Waugh Chapel communities.

[The prepared statement of Mr. Harvey follows:]

Statement of Norman K. Harvey, President,
Greater Gambrills Improvement Association

I live in a very conservative multi-cultural neighborhood that was once predominantly African American. Being an African American and having been exposed to the many facets of public service, I was soon able to transfer skill sets and assistance to this small community that was besieged by large corporations and landfill operators. For decades these corporations had targeted them with disposal of chemical waste and toxic materials. Too often, and on a continuing basis, large organizations and businesses too eager to turn a large profit margin, target communities of disproportionate underrepresented minority groups (i.e. African Americans, Alaska Natives, American Indians, Mexican Americans and Hispanic groups) for chemical and toxic waste disposal.

Often focusing on certain areas of disparity in subject matter areas such as education, criminal and environmental justice, these corporations prey on these groups' socioeconomic status to unfairly take advantage of their communities, homes and lifestyles. The impact of these criminal predators is long felt months if not years later when health issues arise, and property and home values diminish. State and County officials who often work hand in hand to appease these perpetrators have either left office or attribute their decisions to the greater good of county revenue generated from taxes, permits and fees imposed. The Maryland Department of Environment (MDE), an agency charged to protect the environment and public health of its citizens, has consistently failed the very citizens that have been aggrieved in the Evergreen Road and Waugh Chapel communities.

In 1995 Constellation Energy in partnership with BBSS, Inc (i.e. Reliable Contractors) commenced depositing fly ash into a 63 acre pit known as the "Turner Pit" not more than one half mile from my community under the guise of reclamation but

their real motive was profit. Fly ash is a byproduct of burned coal from power plants that capture it with air pollution control equipment. According to MDE, approximately 2 million tons of coal ash (i.e. fly ash and bottom ash, which is heavier than fly ash and is captured at the bottom of a combustion device) is currently generated each year in the State of Maryland. To date, more than 3.8 million tons of this highly toxic CCB have been dumped into the "Turner Pit" without adequate protective devices in place such as liners and leachate collection systems. In addition, the operators have neglected early warning signals from monitoring wells.

State and County officials were well aware of the probability of groundwater contamination due to earlier contamination of the Brandon Woods/Solley Road residential community seven years earlier. The Turner Pit project was approved by MDE just as the Brandon Woods project with the knowledge that severe ground water and aquifer contamination was an immediate threat of endangering the health of its citizens.

In June of 1999, MDE was made aware of groundwater and aquifer contamination above the 500 mg/l (milligrams per liter) permit limit for sulfates. MDE and the County Health Officer allowed continued operations; disregarding public health threats to the Evergreen and Waugh Chapel communities. Had a site specific analysis been conducted prior to commencing operations and the prior knowledge of the Brandon Woods/Solley Road disaster taken into consideration, this second incident of fly ash contamination would have been avoided by having the proper safeguards in place. A site analysis would have revealed that the acidity of the groundwater causes a greater acceptance to contamination without leachate systems and liners in place.

In 2000, MDE allowed special exceptions for extending the operation to an adjacent pit known as the "Waugh Chapel Pit"; disregarding specific findings and knowledge of leachate contamination at the first site including airborne contamination of fly ash particles. It has been estimated that the sites have generated more than $15 million dollars profit in taxes, permits and fees for Constellation Energy (a $19 billion dollar a year energy giant) and Reliable Contractors.

In 2004 a pump and treat system was installed at the "Turner Pit" to stem the tide of leachate plume down gradient from the site; however three residential wells already indicate high concentrations of calcium and potassium which are precursors to leachate migration, in addition to abnormal levels of aluminum being recorded. It is a fact that potentially cancer causing sulfates have been discharged into residential well water three times higher than EPA regulated safe standards.

In October 2006 test wells indicated 4,480 mgl/l at the Waugh Chapel site and operations were allowed to continue under existing MDE and County scrutiny. Some residents were forced to depend on garden hoses and pipes attached to fire hydrants for water, in addition to being furnished 12 ounce bottled water by Constellation Energy during the winter season.

In June 2007, according to a report by Maryland's Department of Natural Resources, 34 residential wells were contaminated with toxic elements including arsenic, lead and cadmium at levels as high as three times EPA's maximum standard for safe drinking water.

In September 2007 Constellation Energy voluntarily issued a "Consent Decree" to stop fly ash deposits after the site had been 90% filled, however the Waugh Chapel residents still rely on 12 ounce bottled water for their drinking needs.

Historically, across the nation and particularly in underrepresented areas, large waste producing corporations have sought old mining shafts, sand and gravel pits for fly ash disposal sites with little or no regard for public safety. The problem does not lie primarily with the waste product but the lack of proper safeguards and poorly regulated controls and ordinances.

In 1993 EPA under the Federal Resource Conservation and Recovery Act (RCRA) made a determination that it would no longer regulate coal combustion waste (i.e. coal ash/fly ash) as a hazardous waste. In doing so, EPA gave license to existing state waste managers who were not qualified nor equipped to adequately safeguard public safety or public drinking water.

Over the years, MDE has allowed loose interpretation of the EPA determination and non- enforcement of the same laws as necessary for industrial solid waste landfills. In addition, MDE fore-goes critical individual site review and environmental site analyses for permit applications. One study indicated that such reviews are critical for spotting potential hazardous conditions to communities and homeowners who are dependent on groundwater as a drinking water source or as in the case of the Crofton Area Township which relies on three aquifers for public drinking water as well.

It is and has been determined that MDE should have required a site liner and leachate collection systems prior to the Turner and Waugh Chapel operations, but

again the Maryland watchdog agency in place failed to protect the very citizens who depended on them for their public safety and health.

Currently, MDE is in the process of re-writing proposals and regulations for stricter disposal of fly ash but without the participation of local citizen groups and environmental justice organizations most affected and that would benefit from such partnership. Environment Maryland along with Crofton 1st are organizations that would prove most beneficial to MDE's newly proposed Coal Combustion Byproduct regulations by working with the county and state to (1) allow community and public involvement in the rulemaking process and (2) ensure that new legal requirements covering the use of fly ash in landfills and abandoned mines are adequately protective for underrepresented communities that have long been the targets for chemical and toxic waste disposal.

The term, "beneficial use" of coal ash must be redefined from roadway fill, highway embankments, soil conditioner usage and with greater measures to ensure that it is mixed with or used as a bonding agent to prohibit environmental/public exposure.

Federal, State and County officials must safeguard the general public and any close lying communities from fly ash particles in ambient air. Open fields of fly ash particles generate clouds of dust often coating nearby residential homes and cars. Operating permits should include plans for monitoring coal dust and stringent enforcement.

Also, any existing CCB facilities should not be grandfathered or allowed to expand under old existing permits and/or granted special exceptions as currently and previously been the norm.

Once protective systems are in place (i.e. liners and leachate systems) it should be certified and verified by federal, state and/or county officials to ascertain that it meets all necessary requirements. Officials on site must guarantee correct liner thickness and proper placement prior to any fly ash deposits.

Most importantly, it is of my opinion that statutory mandates should be enacted instead of regulations now currently being developed or proposed. As seen in the past, regulations can often be administratively changed, but statutory mandates that are voted into law are not susceptible to quick change by administrative/county officials as is currently the case.

In closing, I would like to see a special delegate for future rulemaking processes in the A.A. County assembly and elected by the citizens with a defined role to raise environmental issues that have so grossly been ignored by State and County officials. Notwithstanding, I would also organize a citizen watchdog steering committee entitled PECCL (the People's Environmental Coalition for Cleaner Living) that would work with that special delegate and serve to ensure that these unfortunate events would indeed be a thing forever of the past for citizens in Anne Arundel County.

Mr. COSTA. Thank you, Mr. Harvey, for giving this firsthand example. In the question and answer we will have an opportunity to get further detail from you. Of course, your entire written testimony will be submitted for the record.

Now we are to that point of questions, and hopefully you will provide us with some answers. Mr. Norris and Ms. Evans, in the Environmental Protection Agency's list of damage cases from coal combustion as of 2007, the list that was provided to us totaled 67.

Do you think that tally of cases is a reflective example, or do you think it is just the tip of the iceberg?

Ms. EVANS. Thank you. That is an excellent question. I think that it is absolutely just the tip of the iceberg for a couple of reasons.

The first reason is that EPA does not actively investigate sites. It relies primarily on citizens to notify EPA of sites, citizens or states, but that is no guarantee that the EPA will investigate upon notification.

Second, the primary reason why it is the tip of the iceberg is that most sites in this country, most disposal sites, are not adequately monitored and some, perhaps the majority, are not monitored at

all. There are at least 600 disposal units, and these are either waste ponds or landfills.

As EPA noted in its determination in 2000, most of these are not monitored, so if there is no groundwater monitoring it is extremely difficult or impossible for EPA to determine the impact on health and the environment of that unit.

Mr. COSTA. All right. I think you have answered my question.

Ms. EVANS. OK.

Mr. COSTA. I am mindful of my time.

Mr. Norris, do you want to quickly comment?

Mr. NORRIS. Only that I think Lisa touched on the basic points that I would have touched on.

Mr. COSTA. So you concur in essence?

Mr. NORRIS. Pardon?

Mr. COSTA. You concur in essence?

Mr. NORRIS. Yes.

Mr. COSTA. Dr. Burke, in the line of questioning that we had with previous witnesses I made the comment that what might be the best type of framework to deal with this coal waste disposal and talked about the Environmental Protection Agency setting up the framework with states then requiring to comply within a time period.

With your understanding of the health risks, the risk assessment versus the risk management, what would you think is the appropriate way to deal with this issue?

Mr. BURKE. Well, I think you heard a number of good suggestions because if you have seen one coal waste site it seems like you have seen one, and you need to have the tools to be able to evaluate them. They are very different.

For instance, in Anne Arundel County with shallow groundwater and sandy soil and acidic groundwater, you have a particular threat there that may not be the same in other places, like Wisconsin. I think you need to get the tools from all three branches of the agencies—strong Federal guidance but with states ready to have the authority to move in and to oversee the monitoring and the selection and construction and management of the sites, and also tools for the locals as you hear the frustrations of local folks who are concerned about their well water, to be able to conduct investigations and have the resources to do that. I think there has to be an active partnership.

As a former state regulator in New Jersey where we have a history of things that are buried, as you know——

Mr. COSTA. That is not the waste we are talking about, I don't believe.

Mr. BURKE. That is right. That is right. We certainly don't want strong constraints over the flexibility of the state agencies.

Mr. COSTA. No. I think the states are well prepared to deal with it if they are given the goals which to achieve.

Mr. Norris, quickly. Why do you think some states are more effective, like Wisconsin and others, than other states?

Mr. NORRIS. I am not extremely sure why. In my experience——

Mr. COSTA. All right. Well, if you are not sure why that is an answer.

Mr. Harvey, you in your slides indicated very clearly the impact it has had on your community. I would like to kind of get a sense of how well you think at this point the state and the local authorities have responded and where are you in terms of, in your view and the community's, of cleaning up and fixing this problem?

Mr. HARVEY. Mr. Chairman, I have been contending with this issue well over 13 years, and I contend that MDE has allowed a loose interpretation of EPA standards for the disposal of chemical waste.

It has been a frustration for a lot of the residents, as well as myself, in trying to get this area cleaned up. As far as the aquifers that have been contaminated, as I heard my colleague say, you cannot go back and reclaim that. It is done. There has not been a very good response by the county and state in terms of trying to clean this situation up.

Mr. COSTA. All right. My time has expired, and therefore so has yours.

I don't know if it is fair to put a number on it, but do you think the job has been 50 percent done or they haven't addressed it at all? I mean, I am trying to get a sense.

Mr. HARVEY. Mr. Chairman, at this point they don't know how to address it. The leachate that has migrated under the aquifers, the damage has been done.

There has been certain recommendations of how to actually regain the groundwater, but you cannot. There is talk about a slurry system, which is very expensive.

Mr. COSTA. So you are saying in essence it hasn't been——

Mr. HARVEY. Nothing has been done to do anything.

Mr. COSTA. OK. All right. All right. Thank you. My time has expired.

And now our Ranking Member, one of our newly elected members from Louisiana, Mr. Scalise. Welcome. Good to have you here.

Mr. SCALISE. Thank you. Thank you, Chairman Costa. I appreciate the introduction.

Mr. COSTA. Scalise or Scalise?

Mr. SCALISE. Scalise.

Mr. COSTA. Scalise.

Mr. SCALISE. That is it.

Mr. COSTA. Italiano?

Mr. SCALISE. Full-blooded. Both parents.

Mr. COSTA. We have a lot of Italianos here this morning.

Mr. SCALISE. Lineage back to Sicily on both sides.

I don't have a prepared statement, but there were a number of organizations that had some testimony that they wanted to enter into the record that couldn't be here to testify, and I would ask unanimous consent that these documents be included in the record for the hearing from the Edison Electric——

Mr. COSTA. Without objection. They will be adopted, and we will submit them for the record.

Mr. SCALISE. We will submit all of them. We don't need to list them by name. Thank you.

[NOTE: The documents submitted for the record have been retained in the Committee's official files.]

Mr. COSTA. Thank you.

Mr. Sarbanes for questions?

Mr. SARBANES. Thank you, Mr. Chairman. I want to thank you.

Mr. COSTA. The gentleman from Maryland.

Mr. SARBANES. Thank you.

Mr. COSTA. A good Greek gentleman from Maryland.

Mr. SARBANES. Since we are testing the ethnic origins of our panel members today.

I want to thank the panel because this is the testimony I was particularly interested in hearing today on the health effects and the impact it is having on people's lives. I am coming away from this hearing much more convinced. I mean, I was leaning this direction, but I really hear a need for some kind of Federal baseline here.

Because I think that the Federal regulations of some kind have the effect of saying sort of stop, look, listen. Before you go to dispose of this kind of waste, you need to do testing. You need to do an assessment of what kind of combined effect of the waste with particular environmental circumstances that exist is going to occur and so forth. Without a dedicated source of regulatory authority that is addressed to this, I am not sure you get that.

Frankly, it is easy for people to come up with excuses later because they say well, this one didn't quite apply and that regulation didn't really fit and so forth. There is a lot of finger pointing that goes on, particularly now that the amount of coal combustion waste that is going to be generated looks like it is going to increase significantly for a variety of reasons across the country.

This is a classic instance in which later we will look back and we will say we had all the warning signs to put some kind of regime in place, and we didn't take advantage of it.

Mr. Harvey, I want to thank you for your testimony today because, frankly, it is citizens like yourself who refuse to keep quiet over a period of years that I think end up being the ones that bring attention to these sorts of issues and finally make it possible to address them.

Sadly, often the communities that cry out the loudest are not the ones that get the benefit of the regulation. It is others that do, and you have testified to the fact that "the damage has been done" in many respect in your community.

I was curious. Would you describe a little bit more about the impact it has had on the lifestyle of residents of your community over these period of years, in terms of adjustments you have had to make, and other continuing anxieties that you may have?

Mr. HARVEY. Well, it continues day-by-day because of the fact that since the groundwater—OK. I am sorry. As I was saying, it continues daily because of the after effects of the groundwater contamination.

The entire community has to now depend on some aspect of public water being put in place. Every well has been somewhat contaminated with large concentrations of aluminum, which is a precursor to actual contamination of the wells.

There is a number of children that have been affected, as well as older adults and surrounding communities as well. There is a little girl named Megan Coleman that lives in the area that has

asthma, and it has been just exaggerated by the coal ash contaminants that have been airborne in ambient air.

They have no screening process in effect for open fields of coal ash contamination as far as the dust particles. Residents have power washed their houses and their cars for this fine grade dust that has accumulated over the years simply during the summer months. It is a continuing battle, Congressman, against what we have in terms of what has already been done.

I am not interested as much in enforcement procedures, but I am interested more in administering a baseline for preventative measures for this type of contamination. I think that the Federal threshold should be much higher than what it is in terms of combating the situation.

There are a lot of recommendations, but we need to put into effect those particular rulemaking processes that are in process now so this will never happen again, not just in Anne Arundel County, but across the Nation as well.

Mr. SARBANES. Thank you.

Real quick, one question for Dr. Burke. You talked about the importance of analyzing and trying to measure the combined effect of all of these various chemicals that are in the mix, and I assume that is difficult to do, but how does one go about that?

I would imagine there are other instances in which the combined effects have been measured and steps have been able to be taken.

Mr. BURKE. Well, we know even from being careful with drug interactions, our own medications, we have to be careful about things that might have the same adverse effect.

The same thing goes for environmental contamination. As you heard from Mr. Harvey, there are pathways of exposure that are more than just groundwater leaching here. In this specific case study of airborne exposure, probably the soil has been contaminated by a down wash of things over time too.

So looking at all the exposure pathways in the risk assessment, for instance, EPA's risk assessment should look at all those exposure pathways, should look at the full range of the toxic substances that I showed to look at the key effects and what both their short-term impacts might be, as well as long-term increased risk for the community.

Not just for those acutely exposed, but the long-term risk for the aquifer and future generations because billions of pounds are kind of forever when they are underground.

Mr. SARBANES. Thank you. Thank you.

Mr. COSTA. All right. The panel has done an excellent job, and I want to thank you for your comments and your concise responses to our questions.

We have a letter that I would like unanimous consent to submit for the record by the State of Wisconsin from their Department of Natural Resources detailing the Wisconsin experience. Without any objection, we will deem this letter submitted for the record.

[The letter from the Wisconsin Department of Natural Resources submitted for the record follows:]

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
Fax: 608-267-3579

June 6, 2008

The Honorable Jim Costa, Chair
Subcommittee on Energy and Minerals
Committee on Natural Resources
U.S. House of Representatives
1626 Longworth House Office Building
Washington, D.C. 20515

SUBJECT: Beneficial Use and Disposal of Coal Combustion Wastes in Wisconsin

Dear Representative Costa:

I would like to thank you and the members of the House Subcommittee On Energy and Minerals for the opportunity to provide information regarding our experience with the beneficial reuse and disposal of coal combustion wastes (CCWs) in the State of Wisconsin. I regret not being able to testify to the Subcommittee in person, but trust that these written comments will assist you in your deliberations on this important topic.

We have previously provided the U.S. Environmental Protection Agency (EPA) with related comments in response to the Notice of Data Availability (NODA) for the Disposal of Coal Combustion Wastes on February 11, 2008 and presented a summary of our environmental data regarding coal ash disposal sites to the National Research Council (NRC) for inclusion in their March 1, 2006 report Managing Coal Combustion Residues in Mines.

Under Wisconsin statutes, CCWs are considered solid wastes and their use and disposal have been regulated by the state accordingly since the early 1970's. Current regulations limit land disposal to licensed, engineered disposal facilities under our NR 500 series of administrative rules. Since 1998, use of CCW material for productive geotechnical and civil engineering purposes has been governed by a new rule, ch. NR 538, Wis. Adm. Code, developed specifically to regulate the beneficial reuse of industrial byproducts.

We believe some level of regulation of these materials is necessary. Our administrative rules have grown out of our firsthand experience with numerous CCW disposal sites and the collection of decades of groundwater and other environmental data. We have observed that CCWs can cause significant adverse environmental impacts when improperly managed. Two of the most serious damage cases were profiled in detail in the NRC report; a number of other disposal sites in Wisconsin have caused significant environmental impacts as well. Documented impacts have included threats to human health and welfare due to contamination of aquifers providing water to private water supply wells, impacts to surface waters, and direct toxicity to plant life.

Although contaminants and concentrations have varied considerably from location to location due to differences in coal sources, combustion methods and disposal practices, we have identified boron and sulfate as the two most common CCW constituents exceeding Wisconsin's groundwater quality standards. Additional contaminants exceeding groundwater standards at or near CCW disposal sites have included arsenic, selenium, manganese and, to a lesser extent, molybdenum and lead. Other changes to groundwater quality caused by CCW constituents, such as increased hardness or alkalinity, can diminish the acceptable end uses of groundwater even if specific health-based standards are not exceeded.

Abundant evidence exists to show that uncontrolled CCW disposal can cause environmental harm. In Wisconsin it is the older, unlined CCW landfills and ash sluicing facilities that have been responsible for the vast majority of the documented adverse impacts. By contrast, substantial monitoring and performance data affirm that Wisconsin's current regulatory requirements for lined CCW landfills with leachate collection systems have been very effective in protecting groundwater and surface water resources, as have engineered final cover systems on the older, unlined CCW landfills.

Our monitoring data support, that CCWs can be safely and effectively reused in a variety of different projects, especially as an active ingredient in cement manufacture and as geotechnical fill in highway embankments, airport runway improvements and other civil engineering applications. In fact, of the approximately 1,131,000 tons of CCWs produced in Wisconsin in 2006, over 974,000 tons were beneficially reused under our regulations. That is an effective recycling rate of 86 percent. One major utility was able to achieve a CCW recycling rate of over 100 percent by beneficially reusing not only virtually all of their CCW as it was generated, but also coal ash previously disposed of in a nearby landfill. The reuse of CCW materials in Wisconsin, subject to the design and monitoring standards we have implemented, has not caused discernible environmental impacts. Based on our experience, we are convinced that a responsible and environmentally protective regulatory framework can be developed that encourages the beneficial reuse of CCWs, and establishes sensible minimum criteria to safely dispose of CCW material if landfilling is unavoidable.

While we support the creation of a basic national framework on the disposal and use of CCWs, we caution that there are too many variables at work to justify a set of detailed, one-size-fits-all regulations or approaches for the entire country. For instance, groundwater monitoring for the chemically conservative elements boron and selenium works very well in Wisconsin due to our temperate climate and abundance of high quality groundwater near the surface. States in more arid climates with high natural backgrounds of these elements may not find this monitoring system very effective. Most importantly, the states vary considerably in their dependence on groundwater as a drinking water supply and in existing groundwater and surface water regulatory structures. States and regions also differ with respect to available use markets for CCW materials. Federal regulations should not preempt states from providing additional necessary protections to their groundwater and surface water resources, and should account for the variability that does exist amongst states.

We believe any broad national approach developed under the auspices of U.S. EPA for the proper management and monitoring of CCW disposal sites should reserve to the states the ability to regulate CCWs beyond the federal minimums in a manner they feel is most appropriate given their particular circumstances. The U.S. EPA should continue its efforts to work with the states and other stakeholders to find appropriate beneficial reuses for these materials, thereby minimizing the long-term environmental costs of maintaining landfills.

One way to establish such a framework might be through a federal/state effort to develop and actively disseminate CCW landfill and beneficial use design guidelines upon which specific state requirements could be superimposed. U.S. EPA could convene such an effort and also facilitate discussions on markets for beneficial reuse of these materials. Alternatively, the U.S. EPA could establish federal rules that set out certain minimum requirements for disposal and reuse. If federal rule making for CCW disposal is pursued, we suggest using as a model the existing municipal solid waste (MSW) landfill regulatory structure in Part 258 of Subtitle D of RCRA. This program includes setting basic rule contents in federal rules and having the EPA regions review and authorize state rules for adequacy. This would take advantage of the resources that the states have to offer and the procedures and precedent set by the Part 258 MSW landfill rules.

Again, thank you for the opportunity to provide information to this Committee. We look forward to engaging in a cooperative effort on this important topic with the U.S. EPA and other states. We think we have a particularly effective program in place to manage and beneficially reuse CCWs and we would be glad to share further details of our experiences as well as our environmental data.

Sincerely,

Suzanne Bangert, Director
Bureau of Waste and Materials Management
Wisconsin Department of Natural Resources

cc: Holly Wagenet—via email
Wendy VanAsselt—via email
Margaret Guerriero—EPA Region 5
Gene Mitchell—WA/5

Mr. COSTA. At this point in time, I believe, given our schedule on the Floor and our other demands, we are going to bring this hearing to a close.

We do have some additional questions from both the Minority and Majority Members that we would like to submit to the witnesses on the second panel, as well as to the previous panel, Panel I, and we would hope that you would be able to respond to those written questions with written responses within a 10-day notice.

This is an issue that, frankly, I think we need to continue to be focused on. As I mentioned in my opening statement, members of the panel, it has been a decade since this Committee focused on this issue, which is I think obviously way too long.

I would also like to get a better sense and will send a letter to the Environmental Protection Agency as to where they are in terms of the appropriate rulemaking authority and their sense on it, and I would also like to get a take from the National Conference of State Legislatures, as well as the National Governors Association, to once again examine that state and Federal role.

Mr. Harvey, I would suggest to you that as a community activist who obviously is frustrated with too many years of a lack of response to a serious problem affecting your community, that you continue to work with us. I know how sensitive and how concerned Congressman Sarbanes is. He has spoken to me about this issue on several occasions, which is why his interest is here today.

We will continue to work together and follow up to see if we can help you and help your community address the specific problems, working with the State of Maryland.

I want to thank my friends and colleagues from the minority side, those who participated, staff and my colleagues on the majority and their staff for I think what was a good hearing.

At this point the Subcommittee will now be adjourned.

[Whereupon, at 12:00 p.m., the Subcommittee was adjourned.]

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