EASTERN RESEARCH GROUP

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ENVIRONMENTAL PROTECTION AGENCY

PUBLIC HEARING

FOSSIL FUEL COMBUSTION WASTES

Report to Congress

Environmental Protection Agency
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P R O C E E D I N G S

THEA MC MANUS: Good morning, everyone, and welcome to EPA's public hearing on our Report to Congress on fossil fuel combustion waste. I'm Thea McManus. I'm the associate division director of the municipal and industrial solid waste division, and I'll be your moderator for today.

Before we get started, I'd like to thank you for the time that you've spent preparing your comments and coming here and engaging with us and directly presenting your comments, your thoughts and your ideas to us. We are looking forward to this opportunity, and I know the panelists as well as the management team back at the office appreciate the efforts that you put into this.

Let me begin by introducing you to the panelists that are with us this morning. These are the folks that are the core members of the team that develop and put this Report to Congress together. We have -- closest to me is Dennis Ruddy, he's the primary lead person for this project. We have Andrew

Wittner; he is from our economics division. And we have Richard Kinch, who is the branch chief and the industrial and extractive waste branch.

As you know, the purpose of today is to provide you with an opportunity to share your thoughts, your concerns, any insights, ideas that you have on our Report to Congress, and then to give us an opportunity to ask any clarification so we can be sure that we really understand where you're coming from and what your points are. And also, if everybody, as you come up here -- I know you prepared written testimony and that will be useful as backup to your oral presentations today.

Let me talk a little bit about how we're going to run today and the format of today. First of all, I can tell from the sign-in sheet that we seem to have everybody here except somebody from the Clean Air Task Force. Did they -- okay. Everybody is here and as well, as we've had one request for somebody that didn't sign in to speak, and I would like to accommodate that person and I'd think we'll be able

to.

If you do the math, we're going to be here longer than 3:00 as was identified in the Federal Register. But we're willing to extend this because I think it is important till about 4:00 to give everybody an opportunity to speak. You may, in your presentations -- if you hear that somebody before you has made a point and you agree with that point, you might want to just reference that you agree to that or you support that argument, and we do have a court reporter, so it would be duly noted that that is your opinion. And then you could, A, free up time for this individual to speak; B, free up time for people that are perhaps running a little bit over the 15 minutes. And that just might give you an opportunity to stress some other points.

So I would think about that as you're giving your presentation. I'm going help keep you on track, so I'm going to be behind here subtly giving you a warning of five minutes and not so subtly with a sign going over 15 minutes, and I hope I don't

leave any bruises, but I'll be right behind here.

Before we get started, a couple of changes actually in the agenda, so I don't think I'm going to read the list of names. You're basically going to speak in the order that you signed in, and I'm just making two changes to that, so you'll be off by a half an hour. And we're going the break about 11:00 or 11:15, depending on this change that I made, and we're only going to break for ten minutes, and we're going to break again at 12:30 for lunch and start promptly at 1:30. There's restrooms right out here to the right and there are telephones outside.

I think that's about it. Finally, I just want to share with you that we have received a lot of comments requesting an extension. And at this point, what we are doing is thinking through and discussing what our options are for granting that extension. But we do have a court order. We do have a statutory deadline, and even if it made sense and we decided to grant that extension, there's no guarantee that the court would allow that. And therefore, I think it

behooves all of us to assume and operate as if we're working under the six months.

We feel that we can thoroughly and completely review your comments, analyze them, incorporate them if we get them by the June 14th deadline -- if the court doesn't allow that extension. So that's where we are on that. We will let everybody know as those discussions evolve and if the status changes on the extension issue.

Okay. Are there any questions before we get started? I'll leave about five minutes toward the end of the day just for questions on timing or logistics. There will be a written testimony prepared and it will be in the EPA -- in the Office of Solid Waste -- excuse me -- docket in about three weeks. I think we're ready to get started.

The first speaker, Jeffrey Stant.

JEFFREY STANT: That's Hoosier Environmental Council. Don't ask me what Hoosier means or how it came about. It stands for Indiana. And I'm pleased to be here today. I am the director

of the Hoosier Environmental Council, and we have been working on this issue for ten years in Indiana ever since the state passed a law that said that D&R could dump this material, fossil fuel waste, fuel combustion waste in surface mines, and it would be under IDEM, the landfill agency's jurisdiction if that happened. We've been trying to get standards for that.

I'm also here today speaking on behalf of the Citizen's Coal Council, which is the federation of -- national of 48 organizations in 21 coal mining states that help citizens address the massive, and I mean massive, environmental problems that are created by the mining and burning of coal.

We appreciate this opportunity to present oral and written remarks in USEPA's Report to Congress in the draft determination. I will say, however, right away, that there have been barely three weeks since the notice of this hearing was put in the Federal Register, and EPA's report is large and difficult to comprehend. So my remarks are going

to have been cursory, and all 15 minutes of them, and I'll have to save some substantive follow-up of additional written testimony. I'll have more remarks then.

We are very concerned about the bias treatment of issues in this report and the draft regulatory determination and the superficial effort that's being made by EPA to solicit meaningful public review and comment on these documents. I understand you think you'll have enough time to look at the comments you get within 45 days. We think you will, too. That's not the issue; the issue is whether the public will have enough time to review this extensive report with these far-reaching implications. We have seven initial areas of concern and I'll talk about just the first few today.

The first one, and the main one right now, is that the public needs more than 45 days to digest this report and comment meaningfully on it. Number 2 is that the report ignores serious damages to groundwater and threats to people in the environment

that are occurring this waste. Number 3 is that the report appears to mischaracterize the effectiveness of state programs to regulate this waste and the willingness of utilities to voluntarily meet safer disposal standards.

The fifth concern is that the report brings up the issue of coburning of fossil fuels with other wastes, but does not clarify any requirements or provide any recommendations on this issue or on similar issues involving codisposal of wastes covered in the report with other waste.

The report also provides no information or guidance on coal gasification waste, and that's become a big issue in Indiana because the state of Indiana views coal gasification waste now all of a sudden as bottom ash, and is dumping them in mines now right into groundwater without any attempt to isolate the waste.

The sixth issue is that the report is based on a risk assessment that does not reflect the actual damages occurring to the environment from fossil fuel

waste. This assessment apparently does not even consider the potential for serious damages from constituents in these wastes other than the eight RCRA metals. It does not account for the changing characteristics of fossil fuel wastes that may result from attempts to comply with new air pollution standards. It does not examine the risks of the environment, drinking water supplies and people replacing tens of millions of tons of fossil fuel wastes, concentrated, not mixed at all with the spoils directly the water supplies as is presently being proposed by rule in Indiana.

And the seventh concern we have is that the effects of the deregulation of electricity sales across broad regions of the country and the potential for deregulations promote weak disposal standards along the states are not addressed. I want to focus on our first concern, and that is public review and comment, and how fundamental that is to addressing the other concerns. The public needs more than 45 days to digest this report and comment meaningfully

on it.

This report presents a voluminous discussion that's very difficult to interpret. What is clear is that the implications of the final regulatory determination are far reaching. Tens of thousands of citizens live in a vicinity of sites that may used as dumping grounds of the waste involved in this determination. These wastes include more than 4/5 of all coal ash generated in the country, scrubber sludge, any other fossil fuel waste, many other wastes mixed with these wastes and waste whose parent material were coburned with coal.

The report we give a green light to states to allow these wastes to be dumped right into the drinking water of those citizens. Those people should rightfully have sufficient notice and enough time to give meaningful input into such far reaching decisions. The public wants to have a meaningful say. Last week alone, EPA received well over 200 fax letters from citizens and organizations throughout the country requesting a comment period of at least

six months in this report and determination.

The latest copy I've seen comes from William Carpenter, Jr., who's the counsel for the plaintiffs in the original case that led to the consent decree. They're asking for more time and pointing out that EPA's asked the court for many extensions, or several extensions to produce this report. The least they can do is ask the court for an extension to allow the public to meaningfully comment on it. We received copies of these faxes from citizen's organizations in Maine, Connecticut, New Jersey, Washington, D.C., Virginia, West Virginia, Maryland, Pennsylvania, Ohio, Kentucky, Tennessee, Indiana, Illinois, Arkansas, Minnesota North Dakota, Colorado and California, all requesting a comment period of six months. This is a reasonable request considering the following obstacles that the public must overcome in reviewing the report.

The report is very large. The table of contents take up ten pages, the report is 226 pages;

there's dozens of additional pages of glossaries; the index for the docket that support the report has 50 pages referencing 429 documents. The report makes unsubstantiated assertions. For example, the report makes unsubstantiated assertions. Chapter 3 discusses the economic impasse of alternatives for managing utility coal combustion waste. The alternative of managing this waste as hazardous under RCRA Subtitle C is dismissed by statements which assert "if beneficial uses of these wastes were subject to any regulations under Subtitle C, possibly all beneficial use practices and markets would cease." And "the cost of compliance with RCRA Subtitle C by coal burning power producers could reduce the amount of coal consumed in favor of other fuels. Depending on the extent of specific Subtitle C regulations, the cost of generating electricity by burning coal could substantially increase."

This is the end of discussion on one of the most fundamental issues covered by this determination. And that's the impact of regulating

utility coal managed fossil fuel waste fully under Subtitle C. There are no estimates of costs, analysis, data, references or footnotes of references that would explain these assertions. The reader is left to wade through the sea of reports in the docket to figure out where EPA might have come up with these conclusions. That takes a lot of time.

The report is vague and hard to understand. Seven pages of discussion on Chapter 3 focused on a "risk mitigational alternative," and other chapters referenced. That would require disposal of fossil fuel wastes and lime sites with leachate collection and groundwater monitoring. On page 372, the discussion called these discussions "modifications of full Subtitle C requirements" that could be adopted under section 3004 X of RCRA, and states that these measures would be considerably less expensive than meeting full Subtitle C requirements. Their estimated annual cost would be reportedly just 4/10 of 1 percent of the annual sales of electricity by utilities, and that's if they were implemented

overnight.

Yet the report does not recommend this alternative or solicit any comment on it. This raises the question of why EPA discussed it. Has EPA decided that the states and utilities should be allowed to ignore even this basic level of protection? Does it consider the cost of this alternative too excessive? Does it want comments on this alternative? Nowhere is section 3004 X, or for that matter, any other section of RCRA explained in this report.

Citizens, those who live around existing or potential disposal sites, need time to digest the report, gain an understanding of the provisions of RCRA, and figure out what to say.

Now EPA is also asking for commenters to provide substantive amounts of technical information. For example, on page 375, in the text under the recommendation about agricultural uses, the discussion abruptly changes topic to a new topic of mine filling. "The agency solicits additional

information in the form of additional case studies of mine fill situations with the following types of information: Mine fill project design, including aerial extent; volumes; depth; environmental controls; mine spoils mixing ratio; characterization of combustion wastes that are involved; the background; the existing conditions of groundwater at the mine location; and the depth to groundwater at the mine locations. The agency's also interested in obtaining information on analytic modeling tools that can simulate fractured flow conditions and facilitate prediction of alkalinity consumption by acid mine drainage intrusion into the combustion waste."

Surely, EPA knows that the public, including the people who live around mines and have a substantial stake in EPA's decision on mine fills, will be at an almost insurmountable disadvantage in providing this information in 45 days. Only industry consultants will be able to provide this type of information in that time frame, and they will provide what they are paid to provide. The Federal Resources

Conservation Recovery Act required this report to be submitted to Congress by October 21, 1982. It's taken you 17 years beyond the deadline and a lawsuit to produce the report. After taking that amount of time, there is no excuse for EPA not to allow -- not to have already decided that there should be sufficient time for the public to give meaningful input. Given the challenges already mentioned and the implications of this report, that time should be at least six months.

EPA has asked for and received extensions in time to produce the report from the court that ordered it; we can purport and see the merit in granting a reasonable amount of time for the public to review and comment on it. Now our second concern is that the report ignores the serious damages to groundwater and the threats to people in the environment that are occurring from this waste. Section 8002 of RCRA requires "that the report study documented cases in which danger to human health of the environment has been proved." The report

indicates that for such cases to even be discussed, it has to meet "tests of proof." These tests required that there be either a scientific investigation of a site, a formal administrative ruling, or a court decision finding the damages occurred from this waste.

In the case of a scientific investigation, the report is requiring that it should include formal investigation supporting litigation or state enforcement action. These criteria go beyond what is meant in RCRA. The vast majority of scientific investigations and reports that we have seen which document contamination of ground surface waters from coal combustion waste have not been part of any litigation or state enforcement action.

By setting such a high standard for what is considered a damage case and refusing to discuss the evidence of damage unless such criteria are met, the report presents a false picture in which the great preponderance of documented evidence of contamination from CCW is presumed not to exist. The Hoosier

Environmental Council has found six cases in Indiana and at least 19 cases in four other midwestern states of irrefuted, substantive groundwater contamination from coal combustion waste in the groundwater monitoring files of state environmental agencies, and these aren't from wells in the waste; they're wells downgradient of the waste in every case.

In these cases stated typically from groundwater monitoring wells, installed as part of a state permit, show groundwater flowing out of CCW's disposal sites with concentrations of arsenic, lead, chromium, selenium, sulfates, chlorides and/or other pollutants that far exceed drinking water standards. In at least three of these cases, drinking water wells, and in one case, a public drinking water well, had to be abandoned as a result of the contamination. None of these cases are considered to be damage cases by EPA in this report, and they're discussed nowhere in the report. They don't exist. The A.B. Brown plant, the R.M. Schaffer plant and the Universal Mine in Indiana are good examples of these sites. At the

A.B. Brown plant, groundwater flowing through the permit scrubber sludge landfill, goes from being potable in upgradient wells to be being as salty as ocean water in downgradient wells.

Sulfate levels in downgradient wells have reached 63,000 parts per million, 20 times over any level in active mining in Indiana, 126 times over the primary drinking water standard. Boron levels in downgradient water are regularly 10 to 20 times more concentrated than the level considered toxic to corn and beans by the USDA. The state required the operator to build a slurry wall to stop the contamination. The contamination has continued, yet EPA's report does not consider this a damage case.

Downgradient wells at the Schaffer plant have also detected sulfur levels far beyond drinking water standards. Data from the site shows those levels steadily increasing over time in downgradient wells to up to 25,000 parts per million. Boron concentrations at Schaffer are also much higher than the safe standard for irrigation. Potable water has

been rendered unfit for drinking or irrigation. The state is required -- requiring a cover to be put on the site as one phase of corrective action. But the report does not consider this a damage case. Monitoring wells at the Universal Mine disposal site have detected arsenic levels four to five times higher than federal drinking water standards in downgradient groundwaters.

Boron levels have been recorded at 30 times the concentration toxic to corn and beans. Lead levels range from 5 to 36 times the federal drinking water standards in downgradient water. Although no plume of contamination has been determined because they haven't put the wells in to do that, these levels are not in upgradient groundwater or in nearby wells measuring mines for water quality. If potable groundwater being rendered unsafe for drinking or irrigation is not considered a damage case, then what is? Throughout the country, groundwater is a valuable source of water of drinking and irrigation. In the case of irrigation, the cost of replacing

contaminated groundwater supplies with water from a public utility could drive many farmers into bankruptcy overnight. However, none of the cases where CCW has created boron concentration far beyond what is considered toxic to plants are considered damage cases by EPA. You're ignoring case after case of serious damage from coal combustion waste because they haven't cleared a ridiculous obstacle course that doesn't have a legal basis.

You would rather predicate this determination apparently on the notion that no damage exists until entire communities and ecosystems are ruined and people are seriously ill or near death. Citizen groups can try to present damage cases that will clear your obstacle course, but they need time to collect the extensive information that you demand to collect -- be collected to prove this damage, but you refuse to collect and you've refused to collect over 17 years. So give us that time. And I guess my 15 minutes is up, so I'll leave my third concern for you

to read about. I wanted to give you this. I'd like to give this to Mr. Ruddy. This is the state's beneficial use policy, which requires no characterization of the waste and unlimited quantities to be dumped into mines as long as it's deemed beneficial use, if there's any kind of fill for any reason.

THEA MC MANUS: Do any of the panelists have any questions for Jeffrey? Patricio Silva from NRDC? Okay. Felice?

FELICE STADLER: Thank you. My name is Felice Stadler, and I'm here on behalf of 200 environmental and public health organizations involved in the Clean Air Network and Clean Air Task Force. These local regional and national groups are active in a nationwide effort to reduce the significant environmental impacts of fossil fuel combustion at electricity generating stations, particularly older plants, grandfathered under the Clean Air Act. You might be asking why do the groups I

represent care about this report? Well, because electricity generating stations are among the largest, industrial courses of air and water pollution, as EPA points out in its executive summary to the report. Likewise, they also generate the greatest proportion of fossil fuel combustion waste. The comanaged FFC wastes that are subject of this report represent about 80 percent of the FFC waste generated from electric power production. We have only recently become aware that EPA had released this Report to Congress, and our experts have only had the opportunity, since its publication at the end of April, to begin to evaluate it. Contrary to EPA's assertion in the report, the over 200 groups I represent were not asked to participate in the process of developing this report or its draft regulatory determinations as to whether to manage FFC wastes under Subtitle C of RCRA.

We have formally requested the agency to extend the public comment period on this report to allow us the opportunity to review it and make thorough

written comments. The 45-day comment period EPA has offered is simply inadequate for our reviewers to provide you with the meaningful public comment that you've requested. For example, the detailed information EPA seeks on the question of mine filling. As Jeff's mentioned, over 170 groups fax letters expressing the inadequate time for public comment and requesting six months to complete the review.

We are aware that EPA is under a timing constraint imposed by consent decree. We are also aware that that deadline previously has been extended by consent of the parties, and we have been informed by the Council for Citizens Interested in Bull Run that they would not object to an extension of the public comment deadline to October 24, 1999, to allow for meaningful review by the environmental community.

While our experts had not had the time to date to conduct a thorough review of the report and its many underlying documents and appendices, they have been able to give the report a limited review.

On that basis, we can provide you today some general observations and concerns about the report which we we think justify, at the very least, an extension of time, for a more thorough review.

Absent a more thorough review, we would argue that the report is insufficient to support its draft regulatory determination, to continue to exempt these wastes from regulation under RCRA Subtitle C. Based on the review we've done today, we find the report and its conclusions inadequate in the following eight respects. I know I'm limited in time, so I'm going to talk very quickly.

One, the report is exclusively based on industry-provided data. We believe that since this report is based almost entirely on data provided by industry, it strongly suggests the possibility of conflict of interest. One of the peer reviewers pointed out this problem noting the potential for bias and expressed concern about the objectivity of the risk assessments completed for the report. The reviewer stated that a better approach would be to

rely on peer review published data. It is not apparent anywhere that EPA took action based on the reviewer's comment.

Two, in many places, the data is not made available to commenters. Our reviewers have noted that many places the data underlying the analyses and conclusions EPA has drawn from them are simply not available, either in the report or in the appendices or other supporting documents. We note that at least one peer reviewer also stated concerns about the unavailability of certain background data.

Three, the substantial data gaps that we see, even in our quick review of the report, suggests to us that the resulting depiction of risks is incorrect. For example, while there is individual health risk data reported, the report did not identify potential impacted communities, nor did it present community exposure analyses.

As a further example, the report identifies potential ecological risks associated with coal combustion wastes, but then declares that no

documented impact information was available to compare with the risk modeling results. We are aware, however, that several published peer review studies that likely would provide adequate field data exist to permit a comparison.

Four, the peer review -- the report was inadequately peer reviewed. The report was peer reviewed, but we understand that there were fewer than ten professional reviewers, a very small number compared with the typical peer review of scientific studies underlying agency regulatory decisions. In addition to the minimal peer review that can be achieved by so limited a number of reviewers, we find no place in the report or the underlying documents in which the peer reviewer's comments were responded to.

Five, the report is out of sync with agency policies and priorities. Our limited review indicates that the report runs counter to the administrator's persistent biocommunicative toxic strategy. The PBT strategy emphasizes a multimedia approach and commits the agency to coordinate actions

across programs. The report, however, fails to address cross-media impacts of mercury. It also runs counter to the policy on evaluating health risks to children, and the national agenda protects children's health from environmental health threats. The report suggests that cancerous to children from coal waste management facilities that are orders of magnitude higher than unacceptable action level risks under these policies, and yet these results do not appear to factor into the agency's conclusions that the wastes are not required Subtitle C regulation. And finally, it runs counter to EPA's risk assessment policies and guidelines, including the 1995 EPA risk characterization program and the 1995 guidance for risk characterization.

These policies require EPA offices to conduct risk assessments reflecting transparency, clarity, consistency, and reasonableness. Our limited review indicates to us that the report falls short on each of the these requirements. In addition, some of the specific analyses that were

conducted were not conducted in a manner consistent with the EPA policies on the use of various kinds of risk assessment techniques.

Six, the wastes are not adequately characterized. Based on our brief review, it appears that the lack of supportive data on the extent to which FFC waste has been characterized in the report undermines the report's conclusions and findings with respect to potential impacts on public health and environment. For example, only 17 sites and limited samples were used to characterize 600 management sites. The agency admits that it is unsure whether the data characterizing the wastes are representative. Sophisticated modeling is of no use without adequate input data.

The waste characterization data were average for each facility, and then the averages were averaged, which completely masks any high values and is consistent with a conservative approach. Data on organic or radioactive substances when the wastes are not reported although EPA concludes that they

represent no human health risks. The toxicity characterization of the wastes relied on two tests, one of which the EPA's own science advisory board in 1991 noted was inadequate. And finally it appears that the waste characterization analyses failed to even test for mercury. Seven, the risk assessments are not adequate. In our brief review, we have already discovered several ways in which it seems to us that the risk assessment in the exposure analyses contained in the report are inadequate and inconsistent with the agency policy, including the following:

The exposure and risk assessments do not represent a high-end analysis, but rather represent average data. The most important pathway for mercury releases, the volatilization of mercury from landfills, impoundments, cold storage piles, fly ash and agricultural production apparently has not been considered at all in this report. Indeed it appears that the air pathway is completely ignored.

It appears to us that the report does not include any assessment of the community health risks in areas near those waste management facilities. Some of the drinking water risk assessment assumptions seem to be inadequate. For example, the assumption that an adult resides in a home and is exposed to contaminated groundwater for only nine years and only drinks 1.4 liters of water per day. Well, what about the adult who lives in that same home for 18 years and consumes twice that amount of water? A completely reasonable assumption.

Finally, while the agency claims that every effort was made to coordinate the groundwater pathway analysis and the above ground exposure assessment, our brief review suggests that these evaluations were done completely separately. For example, it appears that the inhalation exposure is assumed to occur while an impoundment is active, but no leaching to the groundwater is assumed to occur until the impoundment is closed. Concurrent, cumulative exposures, however, could occur in the real world and

would be significant, particularly for arsenic.

Eight, the report's conclusions regarding controls are inadequate. The agency has references in several places its discussions with industry regarding voluntary control proposals or options for managing the waste short of Subtitle C regulatory requirements.

However, we can, as of yet, find no discussion of those proposals provided for the public to evaluate, although the agency seems to be relying on them in lieu of Subtitle C rules. We find at least one instance in which the report seemingly ignores high levels of cancer risks to children in concluding that FFC waste do not require a Subtitle C regulation. Namely the risk of cancer from exposure to arsenic from coal waste landfills of 1.3 per 100.

Finally, the agency seems willing to defer to state regulation of co-managed FFC wastes citing trends and improvements to waste management facilities. In fact, the trends we are aware of show that few, if any, improvements have been made. For

example, in 25 years, there's been only a 10 percent increase in the use of lined impoundments. Fewer than 1 percent of the impoundments have leachate collection systems. Furthermore, the agency admits that it did not conduct state specific analyses to determine whether states are adequately exercising their authority to regulate the disposal of these wastes.

To summarize briefly, our review to date indicates that the report and its conclusions are flawed, based on potentially biased and inadequate data not responding to peer reviews and inconsistencies with several important agency policies. Given no further time to evaluate, we would argue that the report is insufficient to support an agency determination not to require to co-managed FFC wastes to be regulated under Subtitle C. Our groups will submit more detailed written comments by the filing deadline; however, reiterate the importance for us to give the report a more thorough review -- that it would be impossible for us

to give a more thorough review without extension of time. Thank you for the opportunity to comment.

THEA MC MANUS: Thank you, Felice.

RICHARD KINCH: I guess I'll just ask one. It's clear that you're requesting an extension of time derived for comments, very seriously. I wanted to know, in addition to that, are there any other steps that you could perceive that we could take to help you develop your comments during this time period? We don't know of any instance now, I guess I'll leave it, as we welcome your feedback today or some other time, on things that we might be able to do that help you make your comments.

FELICE STADLER: Yeah, I noted a few things where it's just very difficult to find some of the data that we need to do a thorough analysis, and so we're looking for help to find some of that data. And we can talk after that. I'm sure I have your number that we can call you and get that information. But that is one of the most difficult obstacles we've run into, is getting a hold of some

of that information that you're using to base your conclusions on.

RICHARD KINCH: Well, apparently we have people that should be available to be called and respond and help you locate things to the extent --

FELICE STADLER: Well, we've gone through the docket, and some of those things are not in the docket, so we're having trouble finding some of those, and it would be really helpful to have a staff person who could respond to our requests quickly.

THEA MC MANUS: Thank you, Felice.

AUDIENCE MEMBER: I just want to mention one important step you could take is to have a field hearing out in Indiana or in the lower midwest somewhere with enough notice in time for people to get ready and present this stuff at that hearing. That's not doable within this kind of 45-day time period.

DAN DERKICS: If I could just interject something. It would be helpful for our reporter if folks could request a mike so that we make sure we

get a clear copy of what's being said, and you guys as well, folks on the panel. So don't hesitate to either step up to the mike or ask for the mike. I just want to make sure it gets on his tape.

THEA MC MANUS: Next we have James Roewer from the Utility Solid Waste Action Group.

JAMES ROEWER: Good morning. My name is Jim Roewer, and I am the program manager of the Utility Solid Waste Activities Group, or USWAG appearing today here to present USWAG's views on EPA's March 1999 Report to Congress on the so-called remaining fossil fuel combustion waste. Some of the speakers that will be following me will also be presenting comments on specific portions of the report speaking for USWAG as well as their own companies or organizations. And, of course, we plan to submit detailed written comments on the report in mid June. But today I'd like to provide a brief overview of our position on the major issues in the report.

I'm going the start my comments by

commending the agency and its staff and consultants for their extraordinary effort in producing a thorough, and comprehensive report, which, for the most part, contains well documented and sound recommendations about utility combustion waste.

While I can't say that USWAG agrees with every finding and recommendation in the report, EPA is clearly correct in concluding that none of the remaining combustion waste typically possess the characteristic of hazardous waste, and most importantly, that none of these wastes are actually managed by the electric utility industry in a manner that warrants regulation as hazardous waste under RCRA Subtitle C.

EPA's ultimate recommendation in that respect fully vindicates the expectation of Congressman Tom Bevill of Alabama in 1980 when he sponsored the amendment to RCRA that led to this study of utility combustion waste. During floor debate, Mr. Bevill said "it would be unreasonable for EPA to impose costly and burdensome regulatory

requirements without knowing if a problem really exists, and if it does, the true nature of that problem."

It should be recalled that the Bevill amendment was a response to a 1978 EPA proposal to regulate utility coal combustion waste as special hazardous wastes. Despite the agency's acknowledgment that at that time it did not know much about these combustion wastes, Mr. Bevill was confident that if the agency would only study these wastes and get the facts, the agency would conclude that hazardous waste regulation was unnecessary. As explained to the House, "I am aware of no evidence that in the many years in which fossil fuels have ever been burned in this country, their waste proposal has ever presented a substantial hazard of human health or the environment."

Although Mr. Bevill envisioned the process to take a little more than two years, his foresight regarding the conclusion has shown to be correct, even if his two-and-a-half year statutory timetable

proved to be overly ambitious. Now, 19 years later, EPA has completed the comprehensive study of combustion waste. During this period, EPA staff has communicated with interested stakeholders, both industry and citizen groups alike.

We commend the agency for its openness in engaging with a dialogue with the interested parties. Based on the assembled data, EPA has now concluded that hazardous regulation is unnecessary. USWAG agrees with this conclusion. I want to turn now to EPA's findings regarding utility co-management of coal combustion waste with low volume waste. As EPA correctly noted in the report, at least 80 percent of all coal combustion wastes are co-managed in landfills and surface impoundments with low volume wastes. Co-management is the prevalent industry practice for managing coal combustion waste.

EPA has also correctly observed the trend among electric utilities to install more environmental controls at co-managed waste facilities. Today, more than 50 percent of all

landfills and more than 25 percent of all impoundments are lined. And as older units are closed or removed from service, the trend toward greater environmental controls is likely to accelerate.

Of even greater importance than this trend is the utility industry's outstanding record of responsible management of these wastes. Despite what was obviously a very thorough search for documented cases of environmental damage caused by co-managed combustion waste, EPA identified a total of only six proven damaged cases, all of which involve older, unlined management units, and none of which had any adverse affect on human health. Indeed, as EPA noted, most of the units involved in these damage cases are closed and stopped receiving wastes in the 1980s. EPA's report also noted the fact that the utility industry has achieved an enviable record of compliance with environmental regulations. Although as noted in the report, we are subject to a greater frequency of inspections than other industries, the

ratio of enforcement actions to inspections is one of the lowest of any industry sector, a mere .06 during the 1992 to 1997 period.

And most significantly, not a single enforcement case involved the management of solid or hazardous waste at a utility facility.

While I am pleased to be able to speak with pride about my industry's record of performance, I also know we're not exempt from the occasional management problem. I can assure you, however, that USWAG has already stepped up to develop a proactive approach to address a potential problem identified in the Report to Congress; the environmental impacts associated with the management of pyrites at a few utility sites. That problem was identified by EPA during a site visit shortly before it issued the first Bevill regulatory determination in 1993. Because USWAG had no knowledge about the causes of the problem, particularly given the fact that many utilities were co-managing pyrites with coal combustion waste without any adverse effect on

the environment, we commissioned the Electric Power Research Institute, known as EPRI, to examine the problem and come up with a set of options for preventing the problem in the future. It took the expertise of EPRI chemists to discover that the fact of the cause of the problem was the oxidation of pyrites in impoundments resulting in the leaching of iron compounds into groundwater.

What the study showed was that the oxidation can occur whether pyrites are managed alone or co-managed with coal combustion wastes in surface impoundments. One of the options for preventing this problem is a carefully designed strategy for co-management of pyrites and combustion wastes to minimize pyrite oxidation.

We've gone to great lengths to ensure that all coal-fired electric utilities are aware of the information in this EPRI study. Every USWAG and EPRI member has received a copy of the report. In addition, I've spoken on the pyrite management issue to senior environmental officials and managers at the

meeting of the Edison Electric Institute, and the American Public Power Association, and I'm scheduled to address the National Rural Electric Cooperative Association on this subject in July.

Finally, EPA staff joined us last November at a seminar on pyrite management at which EPRI outlined in great detail the options for avoiding any problems with pyrite management, and we plan to sponsor a second such seminar later this year. In short, USWAG has long prided itself on an organizational philosophy of stepping up to the plate when we discover a problem associated with utility management of solid or hazardous wastes. I'm glad to be able to report we have engaged in actively educating educating our members about the potential environmental impacts associated with management of pyrites and surface impoundments, and how to avoid such impacts. We're committed to continuing that educational effort. EPA's discussion about beneficial use of coal combustion waste in the Report to Congress is

surprisingly reserved. To be sure, the agency discussed at some length the beneficial use applications about which EPA either has some concerns, agricultural uses or about which it lacks sufficient information to arrive at a conclusion, mine backfill. But other than cataloging the other beneficial use applications and finding that no significant risks to human health in the environment were identified, or believed to exist for any beneficial uses of these wastes, EPA proposed no actions, either to promote increased use of coal combustion products or to remove barriers to such beneficial uses.

We feel this is a missed opportunity for EPA to discharge its statutory mission to increase safe recycling and utilization of materials that would otherwise be disposed of as wastes. According to data provided by the American Coal Ash Association, and you will hear from a speaker from ACAA, and quoted in this report, roughly 25 percent of combustion waste generated in 1997 were

beneficially used.

In the 1988 report to Congress, EPA estimated about 21 percent of combustion waste were beneficially used back in 1985. As you can see, we've only made limited progress in nearly a dozen years between the two reports. EPA speculates that the potential for increase reuse of these wastes is limited, based on demand for products and services where wastes are used. We feel this speculation is far too simplistic. In 1994, the United States Department of Energy published a thorough study of the legal regulatory and institutional barriers to increase use of coal combustion products.

Although there are numerous reasons for the limited growth of the markets for beneficially used combustion products, an important barrier to increasing the amount of products diverted to beneficial uses are regulatory policies that apply waste management regulations to combustion products that do not apply to competing products or virgin materials. Given the report's positive findings on the

absence of significant risks to human health in the environment for most beneficial use applications, EPA can make an important contribution to increasing the percentage of these materials beneficially used with a clear call for ending the application of waste regulations to these materials when beneficially used.

I'll leave discussion on the agricultural uses and mine backfill activities of coal combustion by-products to other colleagues of mine that will be making statements following mine. I want to conclude my remarks with some brief comments on EPA's findings on oil combustion waste. The agency is certainly correct that oil combustion waste rarely exhibit hazardous characteristics and may not present a significant risk to human health and the environment.

It's also significant that EPA uncovered only one documented case, a documented damage case associated with these wastes and that did not involve human receptors. Other potential damage cases

studied involved suspected releases to groundwater, but in none of the cases was there any drinking water contamination or other environmental impacts.

EPA also was correct in recognizing that oil combustion wastes were very different from coal combustion wastes in that oil combustion wastes are generated in very small volumes as compared to the high volume generation of coal combustion waste. Moreover, as EPA observed in the report, unlike coal combustion waste, the volume of oil combustion to generate -- the volume of oil combustion to generate electricity has been declining for the past 20 years, and this trend towards lower generation of oil combustion waste is likely to continue.

We differ with EPA's recommendation regarding oil combustion waste management in one important respect. While EPA correctly noted that about 2/3 of surface impoundments that manage oil combustions wastes are lined, and the trend is toward increased lining, EPA noted some of the unlined impoundments are permitted under Florida law as

percolation basins designed to discharge to groundwater. These impoundments must comply with state groundwater standards outside of specified zone of discharge. EPA has proposed, as one option, Subtitle C authorities to target these unlined basins. We believe such action is not supported by the record and treads upon the state's prerogatives to exercise their judgment in this area.

Despite a long history of such units, EPA has found no example of any environmental damage associated with these unlined basins. EPA correctly noted that these units are typically located near large bodies of surface water with no drinking water wells located between the management unit and the surface water.

Second, these are not unregulated units. They're permitted under state law and must comply with state groundwater standards at the relevant point of compliance, namely, outside the zone of discharge. These state policies are similar to EPA's own municipal solid waste landfill regulations that

permit compliance at a point no more than 150 meters from the waste management unit boundary on the same parcel of property. Given EPA's well-established policy of respecting state primacy in setting groundwater policies, it would seem strange for EPA to invoke its Subtitle C authorities to supplant state groundwater policy for a relatively few units in the subject area uniquely associated with state decision-making.

We look forward to submitting our detailed comments next month, and in the meantime, I'd be glad to respond to any questions you might have.

ANDREW WITTNER: With respect to the practice of mine filling, as you all know, we're still considering what our options might be in that respect, I'm curious, I haven't worked on this for 18 years, only about four, as to whether the practice of mine filling constitutes a beneficial use or a disposal, and depending on your answer, whether or not your answer makes any difference.

We can take 15 days, I suppose, to discuss

this or we can just drop it now, but I'm curious as to the significance of the answer to this question, if there is one.

JAMES ROEWER: Well, Sam is going to be talking about beneficial use coming up, and I think there are other speakers who are going to be talking about the use of coal combustion products as mine fill and mine reclamation activities as well, and perhaps some of their comments might speak to and address your question.

ANDREW WITTNER: Well, the real question is what might be the significance of the appropriate adjective here, if adjective is appropriate. Is it beneficial or is it disposal?

THEA MC MANUS: Thank you, James. Our next speaker is Dennis Leonard from Detroit Edison.

DENNIS LEONARD: Good morning. As principal engineer in the Detroit Edison company's environmental department. I've been asked to present the utility solid waste activity group's views on the utilization of coal combustion products and mine

placement projects, an issue that's very important to many USWAG member companies, and in particular, to Detroit Edison's coal combustion product management strategy. It is also an issue that is the focus of intense and prolonged efforts by state and federal governments and academic research institutions to develop cost effective and environmentally sound methods to reclaim mined land. CCPs can be used effectively to stabilize mined areas, fill voids and reclaim land lost to productive use, restoring resources and effectively preserving greenfields.

Mine placement of CCPs can also provide unique solutions to intractable hydrogeological and chemical problems that are sometimes encountered in the post-mining environment. Such problems, acid mine drainage, for example, are sometimes encountered as a result of mining activity not from the combustion of coal or the placement of coal combustion products in the post-mining environment. In fact, CCP mine placement is often the only cost-effective way of dealing with some of the

existing problems. The Indiana utilities and the state of Indiana in particular, have provided EPA with a wealth of data in support of their mine placement practices and a representative of the Indiana Electric Association will provide a more detailed statement later today. Researchers from Southern Illinois University and Virginia Tech will also discuss this issue in detail. I will like to use my time to provide an overview of USWAG's position. In the Report to Congress, EPA asked the question, are there any mine fill practices that are universally poor and warrant specific attention? The answer is no. In support of that answer, we have submitted data that establish a lack of risk and demonstrate that the industry's track record is good under existing regulatory controls. We plan to supplement those data in our written comments.

EPA should respect the state's existing authority to make case-by-case technical determinations and should not impose a federal scheme

that might frustrate a research and regulatory system that is working well. There's no need for EPA to develop a federal regulatory solution to a problem that does not exist. The analysis of this issue must necessarily begin with the chemistry of mine placement. Some eastern coal mine sites might be characterized by acidic leachate caused by the oxidation of pyrites from the surrounding rock as well as the coal remaining in the mine. Pyrites are naturally present and are normally stable in coal and rock formation so long as they are kept below the water table. When pyrites remaining in the rock and coal in a post binding environment are not below the water table, they're exposed to oxygen, and oxidation occurs producing acidic leachate. The placement of alkaline coal combustion product in such post-mining environments can produce significant environmental benefits.

The neutralization capacity of alkaline coal combustion products can be used effectively to neutralize acid mine leachate. USWAG will submit,

with its written comments, data from lab analyses of ash samples to fully document the neutralization capacity of various ash streams. And through the return of the water table to normal premining levels, further pyrite oxidation can be controlled and a decrease rate of sulfate reduction would therefore be likely. The neutralization capacity also has the potential to control heavy metals that typically leach from the mine's rock. An increase in pH leads to a decrease in solubility and concentration of heavy metals. Precipitation, co-precipitation and adsorbtion reactions further lower the concentration of metals. For example, the increase in pH causes chromium to precipitate out of solution as chromium hydroxide or iron chromium hydroxide and arsenic to co-precipitate with iron and adsorb on to iron oxides and iron hydroxides.

Downgradient concentrations of these heavy metals are expectedly lowered as the result of coal combustion product placement. USWAG has compiled detailed case studies, including groundwater

monitoring data for 12 mine placement projects conducted by its members. These data represent a significant portion of the total population of the active mine placement projects nationwide. We provided this information to EPA earlier this year in our draft report titled "synthesis of available information on the management of coal combustion products in mines." The final version of that report will accompany our written statements. These case studies are available and available data from state and federal sources and from academia, document that the preliminary concerns EPA has raised in the Report to Congress are not warranted. The statements presented today demonstrate that those concerns are not shared by those in government and academia who have carefully researched the issue, nor are these concerns shared by the agencies with the responsibility for permitting and overseeing these projects.

We believe that sound judgment on the part of industry and informed oversight from state

regulatory agencies are essential for determining whether each specific project is appropriate. USWAG will provide detailed information on state regulation of mine placement of CCPs with our written comments. This information will demonstrate that the states have the necessary regulatory authority and have developed robust and protective mine placement programs.

We are encouraged that EPA has identified in the report to Congress a tenet that those of us familiar with mine placement projects fully respect, that resolution of mine placement problems requires very site specific determinations that do not lend themselves to national standards. State regulators from environmental conservation and mining oversight agencies are well positioned to make such site specific regulatory determinations. In fact, they do so routinely and have been exercising their informed judgment over such matters for years. They have ample regulatory authority to constrain inappropriate practices when the site and project specific

characteristics dictate.

And most importantly, they are not constrained by "one size fits all" federal controls. The lack of adverse impacts among the observational data indicate that the combination of sound management practices and existing regulatory oversight has responsibly addressed whatever risk might exist. An analysis of CCP placement in mines is not amenable to generic modeling of the sort EPA employed to analyze the placement in landfills and surface impoundments. As other commenters have demonstrated, the limits of such modeling are easily exceeded even in the landfill scenario, which is for more straightforward and easily reduced to simple algorithms. Any post-mining environment is hydrogeologically complex. These peculiarities of each site demand specific attention.

Therefore, we wholeheartedly concur with EPA's acknowledgment in the report to Congress that real world monitoring data is the best indication of

the effects of mine placement. Predictive modeling at individual sites can be done effectively, and indeed, has been provided as a regulatory basis for a number of successful projects. But such modeling efforts are necessarily complex to take account of unique features of each mine setting.

Again, this approach is not amenable to support a generic regulatory determination. This returns me to EPA's question of whether there are some mine fill practices that are universally poor and warrant specific attention.

In light of my previous comments, again, the answer to this question is a resounding no. In fact, there is nothing universal about mine placement. It is a site specific issue best left to informed discretion of the states. We therefore request that the agency take a long look at the available monitoring data. In addition to the information USWAG will submit, there is a wealth of the data available to the agency from federal and state agencies, from academic research institutions

such as Southern Illinois University, Virginia Tech, Ohio State, and West Virginia University.

We are working to provide as much of this information as possible, and we hope other parties will submit other such information with their comments. We are confident that a thorough review of the data undertaken with an appreciation of the relevant chemical processes will lead you to a conclusion that proper managed mine placement projects do not pose a threat to the environment. To the contrary, they hold a potential for great benefits. Mine placement of CCPs generally can mitigate the effects of acid mine drainage. It can reclaim land lost to productive use and thereby preserve greenfields.

My own company's use of a mine in one of its power plants means that less ash must be placed in landfills, in surface impoundments, and less pressure to develop greenfields. From that perspective, it is only appropriate that for the agency to defer to the regulatory approaches of the

states so that it does not impede progress towards RCRA's statutory objective of promoting the protection of the environment and the conservation of resources not to mention to objectives of the Surface Mining Control and Reclamation Act. Thank you for this opportunity to appear today.

If you have any questions, or if I can be of further assistance, please let me know. One additional comment I would make with regards to your question, whether mine placement is disposal or reclamation, I think the answer is in the context. Certainly there's control of mine placement. Some states regulate their control under --

ANDREW WITTNER: Let me ask that if there's any further discussion of this issue that we distinguish between the surface mines and the deep mines. There are many, many differences between the two analytically and otherwise with respect to the use of models and so on. And so that it would be helpful I think if we are to continue to discuss this question, that speakers may be clear what kind of

mine situation they're talking about. Thank you.

RICHARD KINCH: Let me ask a question. We talked earlier about landfills being lined or at least some percentage of landfills being lined, and the fact that as new units come on, more landfills are being lined. And what I would like to know is do you have any response to, if when we take this material and we put it on the surface above the groundwater table, we are essentially observing people making the decision that this ought to be in a lined unit, at least in many cases and why, in a mine fill situation, you might take this stuff and put it in direct contact with the groundwater table. I find there seems to be, at least at a minimum, an inconsistency, as to why you would line it in the surface versus take the material and put it directly into the groundwater table.

ANDREW WITTNER: We've probably thrown you off so forgive us, but I think it's important to distinguish between the different kinds of fills.

DENNIS LEONARD: Well, that's a good

question. There's at least three instances where there's a rationale for doing that. In EPA's regulation of surface landfills, you have a provision that a liner isn't -- there's generally acceptance in state programs that a natural liner is an appropriate liner. And there's a provision in EPA's groundwater monitoring provisions that if you can demonstrate that your natural liner has a thickness and an impermeability that prevents any discharge to the groundwater unit, you're exempt from having to do groundwater monitoring.

So there's a recognition in those programs that naturally impermeable sites don't require liners. Some of the mine fill practices are in mines that are very impermeable. In fact, if you're going -- well, oftentimes you mine because the rock is so impermeable and you don't have much waterflow into the mines. So you have the issue of situations where you have a naturally impermeable site.

Second situation you might have is a situation where the groundwater is naturally

unusable. It's naturally saline. Or it's naturally elevated in some other parameters such as boron. In that situation, there is no receptor, there is no consequences to mine placement.

A third situation -- and these three situations aren't by any means all inclusive -- the third situation is where you have acid mine drainage, and you have a net positive benefit to the environment from mine placement. I'm sure there's other situations, and you really need to look at these things on a site specific basis. See what the particular impact is at a particular mine. We're not advocating that we place CCP wastes in all mines. What we're advocating is that states have the flexibility to look at such site specific characteristics that I just mentioned and make informed decisions. THEA MC MANUS: Thank you, Dennis.

Next we have Sam Tyson from the America Coal Ash Association.

SAM TYSON: Thank you very much and good

morning still. Happy to be here today to present the views of the American Coal Ash Association on this Report to Congress. I would just like to point out that ACAA's principal members are co-burning electric utilities throughout the United States as well as marketers of coal ash. ACAA will submit detailed written reports by the June 14th deadline. Today I will provide a brief overview of the production and use of coal combustion products as we turn them as well as ACAA's position on some major issues addressed in the EPA report. ACAA was founded in 1968, eight years before the enactment of RCRA, and of course that's been the primary legal guidance, regulatory guidance for our activities to promote the use of ash during this -- during the existence of that act.

More recently, ACAA has acted to expand its efforts to create in the marketplace this coal combustion product status for coal ash creating standards for its use and also the technology that goes along with that. Of course, we now are

referring to coal combustion products not only as the fly ash, bottom ash, boiler slag and FGD material covered under the EPA report of 1988 and the regulatory determination of 1993, but also now a variety of other clean coal combustion materials such as residues from fluidized bed combustion boilers. These are not currently included in our survey data, and they're relatively small by comparison to the 105 million tons of these other four high volume products that we survey annually.

ACAA's mission, of course, is to advance the use of these coal combustion products in ways that are technically sound, commercially competitive, and environmentally safe. A guiding principal for accomplishing our mission is to gain and expand the recognition of coal combustion products for what they are, which is engineering and manufacturing materials. ACAA and its members lead in efforts that result in the use of some 30 million tons of CCPs each year in the United States. In calendar year 1997, the most recent year for which data's

published, '98 data's being gathered and will be published later this year.

The use of CCPs throughout the United States has amounted to about 27 percent of the 105 million tons of high volume CCPs that were produced. I do have a supplemental document which I'll refer to later, but I would just point out that the coal combustion products that are currently classified in our survey as use, to partially address Mr. Wittner's question, are relatively small. But let me get back to that point at the end.

I'd also like the point out that the worldwide use of coal combustion products currently exceeds 100 million tons annually. As in the USA, CCPs worldwide are produced from the combustion of coal, the principal fuel source for electricity needs, they're specified by design engineers as they are here that rely on the availability of CCPs of known quality as a mineral resource for engineering and manufacturing applications. They're marketed by companies that have extensive knowledge of these

materials for what they are, engineering and manufacturing materials. And, of course, there's a well-documented record, both in our possession and other places as well of the satisfactory performance of these materials in these numerous applications.

Our vision, of course is -- everybody has to have a vision statement. Our vision is to be recognized as a worldwide leader in the advancement of ash use. To this end, we currently are working with 20 countries, and we began this process earlier, but we had our first meeting of countries in January of this past year at our symposium that we host annually, or every two years, rather, in the United States.

And next month, just prior, as a matter of fact, to the comments being due to EPA on the Report to Congress, there will be a second meeting which we will attend in southern France, someone has to do this, where 15 countries from Europe will be hosting a meeting which we will attend, because they liked the idea of creating such an organization which basically

will be an Internet-based passive organization, I suppose we would call it, that facilitates the exchange of technical information on the Internet at a particular web site that we have created for this purpose, called the Worldwide Coal Ash Council site. You can find it by going to our site and it will take you to this other site.

In the Report to Congress, EPA goes into some detail with regard to its concerns about agricultural and mining applications. What EPA did not do -- I guess in the same tone of some previous speakers -- what EPA failed to do, was to point out that there is an abundance, in fact, a very great abundance of technical information in existence, which of course was recognized, to a large extent, in the 1993 regulatory determination which basically says that coal combustion products are safe for use, they're technically sound and they should be used.

Nevertheless, EPA really did not describe these volumes of information that document those beneficial uses of coal combustion waste, including,

and I emphasize "including," information that's readily available, or is available, on agricultural and mining applications. We intend to address many of these sources of information, I'm sure some other folks will too, in our written comments that are due on June the 14th, not later than.

And at that time, we feel that we will be able to provide, as will others, provide information to EPA that will assist them in making a clear finding that agricultural and mining applications of CCPs warrant no additional regulation by EPA. EPA has an opportunity now to include in its regulatory finding a message that would support the continuation of its earlier efforts to promote increased use of coal combustion products by advancing efforts associated with its comprehensive procurement guideline and the procurement of environmentally preferable products. This October 1 regulatory determination should, in fact, focus on opportunities for EPA to do that and to help to increase safe recycling and utilization of materials that would

otherwise be disposed.

Included with this statement, I referred to it earlier, is another document which I've submitted for the record. It's 19 pages in a presentation format, which is easy to read and it's concise, and if I can just cover briefly what's contained in this, it summarizes the production of some 105 million tons of coal ash in the USA annually. It addresses the principal uses for some 29 million tons of that 105 million tons each year. And it also describes the annual benefits associated with the use of CCPs, including things like, but not necessarily limited to, landfill space preservation, the avoidance of disposal costs, revenues from the sales of these CCPs, reduced CO2 emissions from the used fly ash, and of course it compares CCPs to other leading mineral resources in the U.S.A., such as crushed stone, gravel, Portland cement, similar quantities of those things are produced.

The report to Congress quotes ACAA's industry data, and we are glad of that. And the

previous speaker, one of the previous speakers referred to the fact that the percentage growth in CCP use compared to production on an annual basis has increased relatively slowly since 1998. That's true. The absolute quantities, of course, are those materials produced have also increased fairly steadily over those years. So the total quantities of those used are up considerably, but the total percentage of use is modest.

And therefore, EPA should now review the considerable regulatory commercial, legal, and institutional barriers that, in fact, impede the use of CCPs, and should work with the industry to advance the use of CCPs. And in 1999, EPA should help to remove such barriers and not create more.

EPA's report says that the potential for increased use is limited, I think that was addressed briefly as well earlier, and we would simply point out that a little help there would be appreciated in creating more barriers, and more concern about the use of these materials and their management is not

necessary because it's being done at the state level in the 50 states.

In light of EPA's correct finding in the report to Congress about the absence of significant risks to human health and the environment, and from the variety of beneficial use applications that exist, EPA should now focus on the resource, conservation, and recovery that are at the heart of RCRA.

And in answer to Mr. Wittner's question earlier, I think my last paragraph really does say this, EPA now is in a position to advance the beneficial use of CCPs, and it can do so by signaling to the 50 states, EPA's endorsement of the end of the counterproductive process, or practice, of applying waste regulations to CCPs when they are used beneficially.

That's the extent of my prepared remarks. I would like to submit for the record a copy of one additional item that I had in my bag which I don't have but one copy of it. But I'll give it to you. I

have plenty more in my office, and that is, a summary of state solid waste regulations governing the use of coal combustion products that we do periodically. This report was published in August of 1998.

I would also point out that we supplied this information to the U.S. Department of Energy, Federal Energy Technology Center, which has taken our survey of 50 state regulations, which are different, they're considerably different, and has posted this on their Internet site. So you can find that on FETC's Internet site.

And again I would simply say there there are discrepancies, there are differences among the way that the 50 states regulate and refer to beneficial use and/or disposal, particularly in mine applications, and that's something that I think EPA, as I said, can take the lead on by signaling the end to waste regulation of beneficial uses. Now we just have to figure out in the 50 states how to determine what is a beneficial use, but I would emphasize that that determination should remain where it is now, and

that is at the state level, without further federal regulation. Thank you.

THEA MC MANUS: Thank you, Sam. I think this is probably a good time to take a break. We'll meet back at about 10 after 11:00.

(A recess was taken.) JIM LINDSAY: Good morning. My name is Jim Lindsay and a senior environmental specialist with Florida Power & Light companies, environmental service department. Florida Power & Light is one of the largest investor-owned electric utilities in the United States. We serve approximately 7 million customers in the state of Florida and have the capability of generating over 15,000 megawatts of electricity. Florida Power & Light operates 13 fossil fired electric generating facilities and is one of the largest consumers of number 6 fuel oil in the world. The combustion of number 6 fuel oil generates ash much like the combustion of coal, however, in much smaller quantities. For comparison, oil combustion products or oil ash represents less

than 3/100 of 1 percent of the national generation of coal ash. Approximately 23,000 tons of oil ash were generated in 1995 as compared to 92 million tons of coal ash.

Florida Power & Light generates approximately 5000 tons, or 25 percent of all the oil ash in the United States. For the past 10 years, I've been responsible for the management of that oil ash at FPL's generating facilities. These tasks have included the removal analysis disposal and recycling of oil ash, as well as developing an overall corporate strategy for managing our company's largest volume waste stream.

My comments today relate to Chapter 6 of the 1999 Bevill Report to Congress containing EPA's findings and recommendations on oil combustion products and are presented on behalf of the Florida Power & Light and the Utility Solid Wastes Activities Group, or USWAG.

Before I comment on the report itself, let me briefly describe our oil ash management program at

FP&L. The majority of oil ash generated by Florida Power & Light is managed in lined settling basins. These basins have to be cleaned out on an annual or biennial basis, depending on the operation of the plant and the capacity of basins. When removed from the basins, the ash is mechanically dewatered and managed in one of three ways: It may be disposed of as an industrial solid waste in an offsite Subtitle D lined landfill; it may be beneficially reused as a source of vanadium for the manufacture or steel products; or we may send it to a cement manufacturing facility where it provides additional aggregate, iron and silica content in the production of Portland cement.

Whenever possible, our company strives towards beneficial reuse of our oil ash. Since 1998, 100 percent of FP&L's oil ash has been recycled and we hope that the conditions that have made it possible to divert our largest waste stream, all of our ash from waste management to reuse will continue indefinitely.

The Florida Department of Environmental Protection regulates our ash management units by permitting the solid settling basins, solids drying basins and the evaporation percolation ponds for wastewater treatment. The department also regulates the ash itself under Florida's solid waste rules. The oil combustion waste streams are batch discharged to the solid settling basins. The wastewater is then neutralized and solids are allowed to settle. Wastewater in the solid settling basins overflow to an evaporation percolation pond. None of the solids or wastewater samples have ever tasted characteristically hazardous.

Groundwater monitoring wells ensure that the water quality standards for a G-II aquifer are not exceeded beyond the point of compliance or in Florida, known as the zone of discharge. All sampling data from these wells is submitted to the Florida Department of Environmental Protection though FP&L believes that the Report to Congress prepared by EPA is a reasonable assessment of the characteristics

of oil ash, and current management practices.

I'd like to address a couple of areas where we think that some clarification is necessary. EPA has expressed concern in the Report to Congress about the unlined evaporation percolation ponds that the Florida Department of Environmental Protection permits under Florida law. EPA has proposed to use its RCRA Subtitle C authorities to adopt tailored regulations to address the discharges to groundwater from these units. This proposal does not seem to us as a wise use of EPA's limited resources for a number of reasons.

First, we understand that the total number of unlined impoundments in the electric utility industry that would be affected by this proposal may be as few as six units, four of which are owned by my company. We have already advised EPA imformally, and I am here today to formally reaffirm that FP&L has made the business decision to remove the oil ash from these evaporation percolation ponds and the basin material from the impoundments and to line these

units. Three of these units will continue to manage oil ash while the fourth unit, at a facility that is being repowered, will be converted into a line storm water management basin.

These steps are part of a broader upgrading of our water management strategy. The money's been budgeted this year, most of the engineering is complete, and the work is scheduled. Although we can not say with certainly that non-utility sectors may also have unlined oil ash impoundments, we believe that the probability that any significant number of such units exist is quite small, and we find it hard to believe that the EPA will would seriously contemplate a RCRA Subtitle C rulemaking that would affect the universe of facilities that may be as few as two unlined impoundments.

We are confident that even if EPA's concerns about unlined oil ash basins is justified. The problem, if it exists at all, is a declining one.

Second, it is far from clear that these

unlined basins pose any significant environmental problem. The EPA has not identified any proven damage cases stemming from management of oil ash at any unlined basin, and the Report to Congress correctly notes that these impoundments are adjacent to either the Atlantic Ocean or salt water estuaries, and that no drinking water wells are located downgradient of these units. These ponds simply have no adverse impact on human health or the environment.

Third, as EPA acknowledges, these evaporation percolation ponds are not unregulated units. They are permitted by the state of Florida under Florida law, and they must comply with groundwater standards at a specified point of compliance outside the zone of discharge. Florida's policy in this respect is similar to the 150 meter point of compliance for groundwater compliance in EPA's Part 258 Municipal Solid Waste Landfill Rules. In addition, all of Florida Power & Light's evaporation percolation units have graded limerock

floor to chelate any leachable metals prior to percolation. And all of these units have groundwater monitoring to ensure compliance with state groundwater standards.

Fourth, we don't agree with EPA's suggestion that the management of oil ash in basins should include the use of composite liners with leachate collection systems. Such an elaborate liner system characteristic of a Subtitle D municipal landfill is more elaborate than necessary for a temporary storage area. These basins serve only as a wastewater treatment system and as a staging area for the ash until a sufficient quantity is collected to justify the mobilization of equipment to remove, de-water, and transport the ash to its final destination, whether that destination is recycling or disposal.

Additionally, one purpose of a composite liner, such as that found in a landfill, is provide long-term assurance that the permanent disposal of waste will be lined and contained even if the liner

fails. The purpose to be served by the proposed leachate collection system in the report to Congress is unclear, is the leachate collection system intended to detect liner leaks, or is it intended to collect leachate for treatment prior to discharge?

The physical properties of oil ash do not lend themselves to this method of wastewater treatment. In the case of oil ash settling basins, the basins are cleaned out periodically which allow visual inspection of the liners to evaluate for defects. If a damaged area is discovered, it can be repaired prior returning a basin back for service. Given this management practice, FPL would suggest that a single liner for ash basin should be sufficient.

And finally, given EPA's strong policy of deference to state groundwater decisionmaking, we fail to understand why EPA, in this instance, is even considering supplanting Florida groundwater policy for a federal imposed zero discharge policy for the imposition of a composite liner requirement.

In short, the tailored Subtitle C option

that EPA proposed in the Report to Congress for addressing its concerns with the unlined percolation ponds would be a classic case of using a regulatory sledgehammer to kill a gnat. A federal solution to overrule and disregard state's primacy and groundwater management policy to solve a problem for which EPA admits there's no evidence of environmental damage.

Let me conclude that while we disagree with this portion of EPA recommendations in oil ash, we are in agreement with EPA's principal recommendations in Chapter 6 that oil ash disposal and reuse remain outside of Subtitle C of RCRA. EPA's study of oil ash is comprehensive and thorough, and with the exceptions that I have discussed, we are generally in agreement with the agency's findings.

We are certainly prepared to work with the agency's staff to implement any voluntary changes in oil ash management if such changes ultimately prove to be necessary to protect human health in the environment. We look forward to submitting more

detailed comments on our oil ash in our written comments. But in the meantime, I would be glad to answer any questions.

RICHARD KINCH: You indicated that Florida Power & Light conducts groundwater monitoring around these evaporation percolation ponds, and that there are Florida state groundwater standards that you abide by.

JIM LINDSAY: That is correct.

RICHARD KINCH: The modeling analysis that we conducted tended to demonstrate some concerns, at least from a modeling point of view, in particular vanadium and nickel and arsenic. My basic question is do the Florida State Groundwater Standards include specific limits for each of those constituents or is there --

JIM LINDSAY: Yes, they do. And in fact there's vanadium, a tertiary vanadium limit; and although we do not monitor for vanadium, we do monitor for nickel at these units, and are in compliance at the zone of discharge with Florida

state nickel levels.

RICHARD KINCH: Thank you.

THEA MC MANUS: Thank you for your presentation, James. And the next person is Joseph Brobjorg from Northern States Power Company, and I really messed up your last name.

JOSEPH BROBJORG: Good morning. My name is Joe Brobjorg. I'm with Northern States Power Company. I'm senior fuel engineer responsible for fuel procurement and ash management issues. NSP is an investor-owned utility based in Minneapolis, Minnesota, serving about 2 million electric customers. And we use about 12 million tons per year of a western subbituminous. Over the last eight, nine years, NSP has been very active in developing, evaluating agricultural uses of coal ash and over the last four years, we have been working intimately with our state regulatory agency, the Minnesota Pollution Control Agency, to allow the use of using coal ash in agriculture.

I would like to address the specific issues

raised in EPA's Report to Congress which purported to identify potential health risks from ag uses from coal ash from arsenic, child ingestion pathways. I'm very concerned on the preliminary conclusions EPA published in the Report to Congress on ag uses of coal ash. I believe the basis for these preliminary conclusions is the nongroundwater pathway human health risk assessment that was performed under contract to the EPA. This risk assessment is seriously flawed, gentlemen, which severely limits its value as a public policy decisionmaking tool. The electric utility and USWAG ardently challenges that the unfounded and overly conservative assumptions that underlie that risk assessment which identify arsenic ingestion pathways for coal ash ag uses.

Based on this flawed analysis, EPA suggests that it might impose a higher degree of regulatory controls on ag uses of coal ash than it has imposed on other agricultural products with similar chemical constituents in agricultural uses. That result would

be highly unfair to both farmers and to industry. NSP and other companies, federal agencies, and academic research institutions have extensively studied ag uses of coal ash. The study demonstrate beneficial results from the use of coal ash in agronomic amounts with no adverse impacts to human health and the environment. EPA should promote the beneficial reuse of coal ash through agricultural applications rather than erect additional regulatory barriers. Lastly, state regulatory agencies can and do provide regulatory controls on agricultural uses of coal ash to protect human health and the environment.

EPA's risk analysis claims to find there is a potential health risk from using coal ash in agricultural due to child ingestion pathways for arsenic. The underlying assumptions using this risk analysis appear to be substantially more conservative than assumptions used in previous health risk analyses performed by EPA for other materials. EPA must maintain a consistent objective basis in

evaluating health risks for the public. And this study appears to subjectively identify risks, but do not objectively exist. EPA's own peer review of fossil fuel combustion risk assessment document, dated September 4, 1998, alerted EPA the serious flaws in that risk assessment criticizing that methodology is obscure in identifying numerous shortcomings that undermine its scientific validity.

Because of these defects, the peer reviewers advised the EPA that this risk assessment should not be used as a decisionmaking tool, yet eight months after completion of this peer review, EPA chose to incorporate those flawed results in its Report to Congress. EPA helped risk assessment assume questionable values for ash application rate, ash application frequency, ash arsenic concentrations, ash ingestion rate, arsenic reference doses. Those issues combined to create additional conservatism to the order of two or three magnitudes above and beyond what sound science would indicate. And if you were to apply those same basic sets of

assumptions to look at U.S. soils using USGS data for the United States, almost all of those U.S. soils would indicate -- would similarly indicate potential arsenic health risks.

Gentlemen, clearly something is wrong here. The USGS data does indicate average U.S. soil concentrations of arsenic in the range of about 4 to 5 ppm with a standard deviation of about 2-1/2, and the study, health risk assessment, identified any material which approaches 1 ppm arsenic is potentially problematic. There's a big problem there. It would be unfair to farmers and industry to impose a higher regulatory standard on coal ash in agriculture than is applied to other agricultural products. Various standards already exist for ag products to protect human health and the environment, and those standards are equally applicable for agricultural uses of coal ash.

U.S. EPA standards for land application of sewerage sludge in the EPA 503-B guidelines provides an additional basis for such agricultural standards.

Granted, sewerage sludge and coal ash are very different materials, but those differences would support less restricted standards for coal ash compared to sewerage sludge. The Canadian Food Inspection Agency also has standards for metals and fertilizers and other soil amendments.

Individual states also regulate land application of industrial by-products including coal ash. These existing regulations provide a very valid framework for ensuring protection of human health and the environment in ag uses of coal ash. NSP and USWAG will submit a detailed overview of these existing regulatory programs. As I mentioned earlier, NSP extensively studied the use of coal ash as a lining fertilizer over the last eight years.

We've completed laboratory testing, green house testing, pilot scale field testing, full scale demonstration testing using coal ash as a lining fertilizer. This testing has been successfully completed on over 500 acres of farmland throughout this evaluation process. These evaluations were performed

in cooperation with the Minnesota Pollution Control Agency, the Minnesota Department of Agricultural, the Minnesota Department of Health, the University of Minnesota Soil Science Department, and the United States Department of Agriculture. Results of these studies all demonstrate that beneficial use of coal ash, when used in agronomic amounts, leads to no adverse impacts to human health and the environment. I have been working specifically in trying to permit a coal ash from NSP's Sherco plant unit 3, which uses western subbituminous coal with a spray dryer scrubber system. That ash material is uniquely suited for agricultural applications in terms of --in addition to its significant lining capability, there's also agronomic quantities of sulfur and boron that the agricultural community values.

Market studies have shown farmers will pay a premium for that coal ash product compared to aglime alone, in recognition of the increased nutrient value in the coal ash. Crop productivities

improved at a lower cost to the farmer when he uses a coal ash liming fertilizer compared to cost of using aglime plus other commercially available sulfur, boron, and other nutrients. This reduction in agricultural costs will result in improved agricultural economy.

Using coal ash in agricultural can also provide significant environmental benefits. Mining and production of other lining materials and fertilizers is reduced. A by-product is recognized as a resource and is beneficially reused for its inherent nutritional value. The need for landfilling of coal ash would be reduced. Soil erosion on farmland, which is a big problem, would also be reduced, because allowing products like this in the marketplace, for example, would allow farmers to revitalize a three-year stand of alfalfa with a coal ash top dressing instead of having to plow that field down and plant high-intensity row crops such as corn.

The Pollution Control Agency of Minnesota

developed a regulatory permitting framework for land applications of industrial by-products which provides for a tiered risk based approach to based on by-product characteristics. Using this permitting framework, MPCA has drafted a permit which would have allowed NSP to use coal ash as a liming fertilizer that is protective of human health and the environment.

Gentlemen, we have been working on this for four years. We were in public notice process to get this on the street when the EPA report to Congress was published in the Federal Register. Needless to say, additional permitting activities suspended pending resolution of these federal issues on arsenic. This permit would allow the coal ash liming fertilizer to compete in the agricultural marketplace as a cost effective beneficial product. The permit would require strict controls on the use of coal ash including maximum ash application rates; soil testing to demonstrate agronomic need as a condition precedent to application; metal concentration limits;

annual loading limits; product registration and labeling under PCA; and Department of Agricultural requirements; ash testing and analysis for QA/QC purposes; recordkeeping; looking at chain of custody; soil analysis records; documenting agronomic needs; records documenting every insight receiving that coal ash liming fertilizer. It would also require operator certifications as a type IV solid waste operator for program operation. It would require annual reporting on coal ash testing, amount applied, et cetera.

Gentlemen, I believe that states can and do implement responsible programs that regulate this type of product.

In summary, the conclusions presented by EPA on arsenic health risk for ag use as a coal ash were not based on sound science. To impose a higher standard on coal ash for health risk analysis compared to other EPA health risk analyses is not fair to farmers or the industry. NSP and industry had extensive experience using coal ash and

agriculture, and state regulatory agencies provide regulatory controls to protect human health and the environment. The purported risk documented in the EPA health risk analysis does not reasonably exist, and there's no justification for EPA to consider additional regulatory controls based on a flawed analysis. Thank you for allowing me to present this testimony.

RICHARD KINCH: The Report to Congress essentially referred to a limit for arsenic that was equivalent to what's naturally found in agricultural lime. My basic question is did the coal combustion ash that you had planned on using, does that exceed that limit? And if so, by how much, or are there other problems that concern you with the Report to Congress and what we mentioned with regard to agricultural lime.

JOSEPH BROBJORG: There are other problems in that regard because if you were to take, again, that naturally occurring arsenic and limestone and subject that to the same analysis for risk

assessment, we'd still have the same problems, gentlemen. Same thing like with any soil. By establishing a default value of 1 ppm arsenic for soil ingestion pathways creates a hurdle that cannot be met in a virgin environment. RICHARD KINCH: Well, that's why we didn't go a strict risk-based number and went with aglime as the basis. Back to my first question, does your material exceed that number, and if so, but how much?

JOSEPH BROBJORG: It is lower than that when you consider that there's approximately a million tons per year of aglime used in Minnesota. Approximately 60 percent of that aglime is procured from wastewater treatment lime sources, and that does have higher concentrations of arsenic compared to the coal ash for the data I've seen.

My coal ash has arsenic concentrations in the range of 8 to 18 ppm. I've seen one number out of the almost 50 analyses which had up to 37 ppm, and I will contrast that with the existing EPA 503-B guidelines which require maximum arsenic

concentrations of 41 ppm to qualify as an exceptional quality material suitable for unrestricted distribution as per EPA 503-B guidelines.

THEA MC MANUS: Thank you, Joseph. The next speaker is Robert Bessette from the Council of Industrial Boiler Owners. ROBERT BESSETTE: They usually put me on before lunch and that's because they know I'm always hunting for food. I want take this opportunity to thank you for the opportunity to present public comments on the waste combustion fossil fuels Report to Congress regarding the management and beneficial use of ash from industrial and nonutility combustion sources. It's not always we have the opportunity to compliment EPA. The other guys are usually harassing them.

ANDREW WITTNER: Bob, it's not often that we wish to hear a compliment.

(Laughter.)

ROBERT BESSETTE: We support the general conclusion in this RTC that the Bevill exemption

should be continued. We also believe that the data found RCRA policy support further conclusion that no aspect of these substances warrant subjecting them to federal state RCRA programs or counterpart state solid waste programs or to a national Subtitle C regulation in any form. In fact, we see the general principles in this report as a framework that should control how special waste determination should now be conducted by EPA. You guys did a good job. Those principles include the weight EPA gave to the current and projected ash management, practices by affected industrial sectors, and to the state efforts to address ash management in reasonable ways. They also include the way EPA treated so called damage cases and the way it conducted its risk evaluations to conclude that the risk to human health and environment from those substances do not, in general, rise to a level of national regulatory concern.

I am president of the Council of Industrial Boiler Owners, I represent about 100 or so owner operators, architect engineers, suppliers to that

industry, 20 or so university affiliates. We only work on energy and environmental issues. Nothing commercial. We look for and strive to produce and generate sound regulatory policies for the industrial boilers. We always seek to promote the national best interest by supporting a rebuilding of the industrial energy base in the United States to improve and maintain our standard of living and continue to clean up the environment.

Sometimes I can wave the American flag and it feels good because I'm not looking at something. We can look at it from the perspective of energy use and needs. Back about three years ago, we started a special project. The objective was to put together information, we didn't know what the answer was going the be, or what the ash characteristics would be. We began and developed what we call special waste program. We started looking at and asked and involved EPA and said what to you need? We want to help and provide the kind of information.

Through this special project, CIBO

developed a more than 70-page detailed survey of industrial FBC units, and a shorter survey of conventional and industrial combustion sources for comparison to utility information. We started out -- in fact, we asked some EPA people to be there -- we started out with a 54-page survey. And the CIBO special project members increased the length of the survey from 54 pages to over 70 pages to be able to provide the kind of information that would be able to address the eight Bevill study amendments, or study factors. Very important.

We would like to give special thanks and commendation to EPA for their working with us, and especially Dennis Ruddy, Dan Derkics and Andy Wittner. Their candid, very candid, highly professional comments and review of information in our process helped prepare or helped us prepare a report of the highest quality and applicability to address the eight Bevill study factors. They went so far in our initial discussions -- we wanted to involve environmental people -- they went so far as

trying to get environmental people to sit in in our discussions to help us make sure that the information that we were generating was going to be of a top utmost quality, that this information was going to be applicable and could address the questions that were coming up.

We couldn't get anybody. Throughout the process we've always maintained that real life data and experience is far superior to modeling projections. Modeling, no matter how good, cannot replace real data. Models no matter how good, cannot account for all the variables in geology, hydrology, meteorology and mother nature in general, at even one site, never mind across the continent.

As a television commercial once said when I was kid, you can't fool mother nature. As I was thinking on the Metro coming in today, I understand why they call mother nature "mother," because like a woman, it's almost impossible the understand all the facets.

Models, no matter how good, cannot account

for human and technological development over time. They're static snapshots, not dynamic movies. Because of their limitations, environmental models including the risk assessment models are always -- and I believe by necessity, extremely conservative. They substantially overstate real world exposure and risk, they're even more conservative when the screening levels are set at extremely low thresholds and their internal default assumptions maximize projected impacts and define significant impacts very stringently like defining the significant impacts for arsenic at 1/20 of the national drinking water MCL for that substance, or the 503 sewerage sludge standards, or defining the horizon for impact as any projected impacts over a period of 10,000 years, 10 millenniums.

I was trying to think of human development, or technology development. Over the last millennium, never mind the next ten millenniums, we don't take that into consideration. Congress has to find several specific criteria by which EPA is to

determine under what regime Bevill waste should be managed. In the case of wastes combustion of fossil fuels, EPA carefully and thoroughly evaluated those criteria, and concluded that Subtitle C regulation is not appropriate for fossil fuel combustion ash disposal and most aspects of ash beneficial use. We wholeheartedly agree. Under those extraordinarily stringent evaluation criteria, we further believe there is no need to change the way we do things today. Any fossil fuel combustion ash, beneficial use should be exempted.

There are massive amounts of real world data to support this when considering the eight Bevill study factors. This report does reserve certain questions concerning mine reclamation, mine fill applications, the use of fossil fuel combustion ash for agricultural purposes, and oil ash disposal.

I would offer a few brief comments. We are preparing a detailed set of comments to support the conclusion that there is no need the change the way we do things today. And these will be in by, at this

point, the 14th.

In the overall Report to Congress, the only concern raised by the agency's extremely conservative evaluation criteria for solid fuels is related to arsenic, but if the projected arsenic impacts were evaluated against concentrations ten times more stringent than the national drinking water or sewerage sludge standards, it would take 30,000 years before there might be a health concern.

That's 30 millenniums. That assumes no human development or technology development in that period of time. If those impacts were evaluated against the permissible ash concentration for those drinking water and sewerage sludge standards, it would be 60,000 years before there might be a concern.

It's hard to imagine the evaluation of fossil fuel combustion products would exceed the stringency of sewerage sludge regulations. If my lunch -- I think food -- happens to fall on the ground or fall in an ash pile, and that's happened

while I was at coal mines, or utility plants, I probably would pick it up, dust it off and eat it. My grandmother used to say a little dirt never hurt anybody. And I'm still here. However, I cannot say the same if it fell in a sewerage sludge pile. From my -- we have to look at the net impact on the environment. What is the baseline? What is the change? And how does it compare to the risks to health and environment that might be posed without the activity in question?

Beneficial use is extremely important. Significant benefits can be shown almost immediately. It may take 1000 years to prove or disprove a significant environmental concern. From personal experience, I live across the street from a farm. And the guy is out there, he grows corn or soybeans, and the last couple of years it's been corn. He tills the field probably four times a year. I know he's doing it because when I come home or in the morning, there's dust on my cars. I got an acre of land and it's nice out there

in the country. He probably puts, and I see him about every couple of years, he'll bring a small truck and he'll dump a pile of little limestone, I guess. I don't ask him what it is. And he tills that stuff in and he puts that stuff in when he tills the field.

If we look at the net, we have to look at four times a year, compare that and we look at the ash, the amount of times it's tilled, what's in the soil, what in the limestone, look at fluidized bed combustion ash and some of the utility ash, which are much more reactive, they can use less quantities, and we do a true evaluation of what's there, there could actually be a benefit for using these things rather than using what's currently used. And with the changes in technology in the future, it may even be better.

Some of you think the EPA has done a very good job under the constraints. We believe the docket is complete and contains more quality information than EPA has had for the past

determinations. The states are doing a very good job. And the current management practices are very good and continue to get better as technology develops. We fully understand and the overly conservative nature of modeled risks assessments and believe real world data should be used if products that do not pose any credible health threat; accordingly, we believe all fossil fuel combustion waste from the industrial sector should be exempted from classification under Subtitle C whether disposed or destined for beneficial reuse.

THEA MC MANUS: Thank you, Robert. Next we have Patricio Silva from the National Resources Defense Council.

PATRICIO SILVA: Thanks, and still good morning, for the opportunity to testify on the availability of the Report to Congress on fossil fuel combustion. I'd like at this time to acknowledge the testimony by Jeff Stant from the Hoosier Environmental Council, and Felice Stadler from the Clean Air Network, and thereby just about ripped my

comments to a third.

My name is Patricio Silva. I'm here on behalf of the Natural Resources Defense Council. NRDC is a national nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. We have a membership of 400,000 members nationwide, and we have been leading efforts to reduce pollution from fossil fuel fire generating units across the nation. While we were surprised frankly when we first saw this report and have not yet completed a review and analysis of the report, the associated technical support documents and other docketed materials.

We would like to echo comments of the other two commenters that the 45-day period provided for public comment effectively defeats meaningful public participation in commenting on a topic of this complexity.

As you may be aware, since publication of the notice of the availability of the report, over

170 organizations, including NRDC, have requested an extension of the comment period to permit adequate review and analysis. In the report, EPA invites public comment and data on a range of issues, including economic analyses for mitigating potential ecological risks, concerns related to environmental justice, mine filling and other topics. If EPA is serious about soliciting such input, a 45-day period is simply not feasible, and not reasonable under the circumstances.

We also note that, notwithstanding the statement in the report, that EPA maintained contact with a number of environmental organizations to share information and ideas regarding beneficial uses of some FFC wastes and methods of characterizing the risk associated with FFC wastes. We searched among current and past participants in the environmental community on this topic and were unable to identify any environmental organization familiar with the report, its preparation, or its contents. We are particularly concerned about the health and safety of

the community surrounding the estimated 660 FFC waste management units operated at approximately 450 coal fired utility power plants. Over 50 percent of the coal fired facilities nationwide are located within a metropolitan statistical area. Many, particularly in the upper midwest, are located in or immediately adjacent to neighborhoods. And the report, however, concludes, in part, that these types of facilities are typically located in areas of low population and thus present infrequent opportunity for human exposure.

One question we have is the adequacy of the survey identifying and locating the facilities and also assessing the demographic data of the adjacent surrounding communities. We questioned the accuracy of this and other conclusions reached in the report. Further, it appears that the report does not include any comprehensive risk assessment of the health risks for the communities adjacent or near to FFC waste management facilities. Despite our limited opportunity to review the report and associated

technical support documents, we can't provide enough general comments which we believe warrant an extension of the comment period for a more thorough review and analysis.

Absent an extension of the comment period, we believe the report is currently constituted as inadequate to support the findings, and recommendations for the draft regulatory determinations to exempt these wastes from regulation under RCRA, Subtitle C. The report requires additional work to correct these deficiencies and to identify the gaps in the data and analysis. One section I would like to focus on is mercury and its absence from the report.

The report fails to adequately document underlying analyses for EPA's conclusions that the wastes are sufficiently free of mercury contamination to conclude the disposal of these wastes should remain exempt from RCRA Subtitle C.

The 1997 Mercury Study Report to Congress calculated that mercury missions from coal fired

utility boilers amounted to 51 tons per year, representing 33 percent of the mercury emissions from all combustion sources. Also in that report, EPA noted that mercury is a highly volatile metal that exists naturally as a trace element in fossil fuels and can also be found in its wastes.

We're essentially asking what happened between that institutional knowledge and in the 1997 report and this assessment. We recognize also the report addresses coal washing and the fact that 77 percent of all coal shipments are washed prior to shipment, but that still leaves a significant percentage of rock coal being delivered to coal fired power plants. Mercury is recognized as volatilizing from coal piles, runoffs, from ash, and other sources, and we find it extremely troubling that in this report, simply mercury disappears as a subject matter; even to recognize these other sources of information.

The assessment fails to consider the most important pathway from mercury releases. The

volatilization of mercury from landfills, impoundments, coal storage piles, fly ash, and agricultural application. The air pathways were completely ignored in this analysis.

Scientific literature clearly demonstrates the volatilization from mercury-bearing wastes when applied to fields. These considerations must be included in the exposure assessments. The waste characterization analyses fail even to test for mercury, or if they do, the report fails to present the data. In fact, when we reviewed the docket several times, we could find no assessment or supporting documentation on this point, and it may merely go to the point that out of the several thousand pages in the docket, it's an appendix, a particular document that we missed. That speaks to the issue that we need, additional time, if we're going to do an adequate job in reviewing this report.

Despite the conclusion offered that mercury screened out of the analysis based on TCLP results,

the concentrations measured when the minimum values were taken revealed that nationally tons of mercury were being mobilized in these waste sites. This is particularly troubling given the fact that EPA, under its persistent bioaccumulative toxic strategy, has made a priority of cross media approaches to mercury releases and managing anthropogenic mercury emissions from these and other sources.

I'd like to, in closing, ask that the agency take serious consideration to extend the time for the public to make meaningful public comments, and to seriously consider extending its time for its regulatory determination. Thank you. Those are my comments.

THEA MC MANUS: Thank you, Patricio. Next we have Rufus Chaney from the U.S. Department of Agriculture.

RUFUS CHANEY: I'm a research agronomist with USDA's agricultural research service. I been involved with risk assessment for trace elements in soils, plants, food chain, sewage sludge, other

agricultural amendments, and environmental contamination in agriculture. I spent, let's say, four years of my life from '89 to '93 helping EPA correct a terrible first risk assessment for sewerage sludge where they had to abandon their first published rule, and I think that rule was better regarding arsenic than the rule that you have here today.

Mr. Brobjorg mentioned a few points about use, beneficial use of FGD, the desulphurization treatment residues in agriculture. On the one hand, government requires desulphurization generating a much larger quantity of residual from certain power generating facilities, and then when beneficial uses are developed by cooperative research between DOE, EPA, USDA, state university systems and others, when there's no evidence of these risks that are of such concern when it's used at the beneficial rate, and then we come to this report and this risk assessment.

I feel blindsighted because, among other

things, the research community who developed technologies for beneficial use who demonstrated success and benefit from beneficial use were not part of this process. I understand it's difficult. With all the different academic and government and industrial interests out there, but to have one rule, sewerage sludge, allows 41 ppm and products assumed to be applied to the 1000 metric tons in 100 years and so on, that allows 41 ppm, and a risk assessment calculation from this rule that depending on whether -- I'm relying on a RTI claim that when exceeded one part per million, it was already in a risk area.

Mr. Brobjorg made the point, and I think it's a very important idea, and that is that when EPA does a risk assessment that would require you to conclude that 90 percent of America's soils are hazardous, how can you even talk about it without saying to yourselves hey, maybe that's not true. Maybe that's not the way it is? Where did I go wrong? Why don't I ask experts? Because there are

people out there who could have told you, there are publications out there. The drinking water office has gone through a massive input of data from the community about arsenic risk. And in that effort, of course, soil ingestion risk of arsenic is part of what's considered, not just the drinking water supply; the bioavailability of food arsenic is part of that consideration, and the fact that we have significant problems about arsenic in the environment, the United States and around the world that really deserve EPA's attention. And here we are focusing on a very minor, or in my -- as my comments suggest, clearly demonstrated nondangerous level, where we have housing developments being built on soils with hundreds of ppm arsenic from historic orchards, or cotton ground, as well as, of course, the few places where are we have industrial contamination that was bad enough to require Superfund evaluation.

Concepts. One, I think, an example that will tell you why we think beneficial use is a good

idea compared to landfill disposal. Back in the '70s and '80s, a group at Cornell did some research that nicely showed or confirmed what we would say should have been expected, that if you grow crops on pure high selenium fly ash, you will have dangerous crops. Hardly a surprise. Other researchers at Cornell said well, wait a minute, nearly all the crops grown in the United States are deficient in selenium for an animal and human life. Maybe if we use a little bit instead of ten feet pile, maybe it would do some good.

So he did a test and sure enough there was a great fertilizer. The dose does make the poison, selenium, and many of these other materials are not persistent in a bioavailable form, or they're required and used in crops and into foods. That strategy of using responsible rates can be applied to FGD by-products, materials, and one can, as the model Brobjorg presented, growing alfalfa with three- to five-ton projectors every three to five years. As a boron, sulfur and selenium fertilizer and limestone

replacement is a real benefit to farmers. Farmers are going to lose value. They're going to pay more. Rate payers are going to pay more and the entire reason for not allowing that to proceed is assumptions about arsenic risk, that your part of EPA hadn't learned what the other parts of EPA have learned.

I raised other points in my text, but the big ideas are that soil arsenic is not biomagnified in the way that other things are, and more importantly, that soil arsenic is not sodium arsenic for toxicology reasons. When you presume that ingested soil arsenic is 100 times as bioavailable as sodium arsenic added to test diets, when the data have shown that when you deal with soils with 30 to 100 parts per million arsenic, you're more like 5 to 10 percent as bioavailable, relative bioavailability is sodium arsenic, then you've made a serious error.

A tenfold error on that assumption almost by itself puts it into the nonrisk category, but that wasn't the only serious error. You claim to have followed the Exposure Factors Handbook, and yet you

used a 95 percentile soil ingestion of one gram when it's clear that it's in the range of 150 to 200 million grams a day from many data sets, imperfect, but a lot of data that are generally accepted in scientific community. To presume that children are going to be eating a gram of soil per day for six years and less for the next 18 years, and then the next year that I point out the issue of just dealing with children's allowable increased dietary arsenic.

Children are growing and eat a higher amount of food per unit body weight than older people, which means that the difference between the calculated allowable in the food intake from background normal foods can be very small. But using the .0003 RFD milligram per kilogram day, rather than the one used in the sludge rule, one simply collapses a large area down to just a little bit, but put it in proportion. Here was background intake. Here's your allowable, and there was the other allowable which was also one of EPA's listed values that's accepted.

There's another problem in that question,

if the risk from arsenic is indeed cancer, from seven-year lifetime exposure to apply the slopes from that to a short part of life, view it one year to seven years, with that assumption of intakes that are completely out of proportion to the rest of the lifetime where the slopes were developed, causes, I believe, a significant error. Also during the drinking water exercise a whole suite of errors were found in the Taiwan data set that is a basis for the slope, cancer slope, and they had to put it on hold and they still don't have a replacement value that the agency has adopted. Your part didn't understand perhaps that that had been discredited. It was discredited because the original data were flawed, discredited because the water intakes were lower than the people drank, and it was a water arsenic, a high bioavailability. It ignored food intake from rice and yams, the principal foods which have now been shown to be more than half inorganic arsenic so that the cancer slope factor together was off by a factor of 10. So I got three

factors of ten here. That would put it to where there never was an arsenic risk. And that's not all of them, but that's all I'll have time to talk about.

I mentioned earlier these other exposures. I think it is federal policy to deal with the worst risks first. I know this is your risk and you want to deal with your risk, but CCA-treated wood is still allowed to be sold in the United States, when children licking that wood or their fingers after touching their -- will give so much more exposure to bioavailable arsenic than these soil amendment products would give, that it's a joke for you to be deciding that risk from arsenic and beneficially-used FGD by-products would be something that is called hazardous waste.

I mentioned about bioavailability stuff, and so on, and I provide references about each of the technical points that I've raised here. And I'll be happy to respond to technical questions since these are very important technical things that I think

discredit the risk assessment, besides other points that were raised here today.

As a scientist who has worked in risk assessment for many years, I'm very frustrated by the lack of transparency of this rule. I'm a knowledgeable expert, and I can't find, without a great deal of effort, most of the information that is the ultimate, the real thing that shows where the limitation occurred. I think our citizens deserve better than that, and I think that EPA can, at its highest levels, decide that we don't let reports go out, that even experts who have read the entire literature can't find the connecting data without a great deal of effort or coming to the docket.

I agree with other comments about short time, short fuse for the hearing. And as far as I know, USDA was not contacted about this in the review process, and I would have thought that might have been appropriate. And I brought this to the attention of my management and hope that USDA will provide formal comments about most of the issues that

I've raised.

In closing, the evidence that FGD by-product and a number of other coal combustion by-products, can be beneficially used at little or no risk, and great benefit. In many cases, based on the data, thousands of papers that we can rely on to make those conclusions tell me that there's such an important error, that EPA should not allow this document to go to Congress until those errors have been corrected. Thank you.

RICHARD KINCH: I just have one brief question. The sewerage sludge report basically said that those kinds of limits should not be used for other materials because uptake rates and other things would be different.

I guess you certainly like the sewerage sludge rule as it is finalized better than what we have here. What's your comments on use of sewerage sludge criteria within this setting?

RUFUS CHANEY: I think we have enough data on arsenic in bioavailability from soils fed to test

animals. Although the bulk of those are for mine waste that are much more highly contaminated than a soil would ever become from these coal combustion by-products. One of the places where there is a big difference between the two is the short term effect on uptake, but compared to a number of other categories of wastes or by-products that are considered for use, the coal combustion by-products contain oxides that can adsorb specifically arsenic on iron aluminum and other oxides. So in terms of these factors that would affect plant uptake and bioavailability, I don't think they are so different that they would be a factor too different in what we would estimate ought to be allowed.

Now there are coals that are going to be so high in arsenic that they shouldn't be allowed anywhere on land. Finkelman from USGS has some delightfully tragic papers about human poisoning in China from coals collected by citizens from local resources. I mean, if you want to learn about hazards of coal wastes, you'll read his papers. We

don't do that in the United States, and the companies know that they got to protect themselves from that kind of risks and they use higher quality NSP, in particular, uses -- because they wanted to have a product that they can justify, an application program, stick with one coal source.

They don't have such variation from day-to-day that it is a mysterious problem. You're really implying a plant uptake difference between the two as opposed to the direct injection bioavailability. I'll just point out that typical quality arsenic level, coal combustion, fly ash and FGD may show, particularly when high rates are used, a significant uptake of arsenic the first year, and then after a year of equilibrating in soil because there are chemical reactions that take a while to occur, there's no longer a significantly higher concentration of plants because of bad adsorption when it comes to mere equilibrium.

These are well known in the literature.

THEA MC MANUS: Thank you, Rufus. Before

we break for lunch. Let me ask if there's anybody here from the Clean Air Task Force, or from the association of independent power producers. We'll break now for lunch. And return promptly at 1:30, at which point Larry LaBuz will be giving his presentation.

(Whereupon, at 12:07 p.m., the hearing was recessed, to be reconvened at 1:30 p.m. this same day.)

AFTERNOON SESSION (1:30 p.m.)

THEA MC MANUS: We're ready to get started for the afternoon sessions. Larry LaBuz from Pennsylvania Power & Light.

LARRY LA BUZ: Good afternoon. My name is Larry LaBuz. I'm supervisor of ash operations at PP&L, an electric utility company that generates and delivers electricity to 1.3 million customers in central eastern Pennsylvania. I appreciate the opportunity to present comments today on behalf of

the American Coal Ash Association, or ACAA and PP&L on the EPA's Report to Congress; waste from the combustion of fossil fuels. In particular, my comments will focus on mine fill initiatives in Pennsylvania, which, through the cooperative efforts of the Pennsylvania Department of Environmental Protection and the coal mining and power production industries are accelerating the reclamation of abandoned mine lands in Pennsylvania.

According to DEP estimates, there are an estimated 200,000 acres of abandoned mine land in Pennsylvania that is polluting over 2400 miles of streams, making it Pennsylvania's single biggest water quality problem. Pennsylvania's mine fill initiatives range from the conventional placement, which is subject to very specific regulatory requirements governing ash quality and placement, through more innovative approaches to placement, such as the reclamation of crop falls which I will discuss later, coal refuse banks and water filled strip pits, strip mine pits.

These particular projects are being performed as demonstration projects and involve significant testing, research and monitoring measures to insure the placement of coal ash is safe to the environment. The ACAA and PP&L believe the beneficial use of coal ash as mine fill is being effectively managed in Pennsylvania under existing regulatory mechanisms, and federal controls are unnecessary and may even thwart these beneficial initiatives.

Now I would like to discuss PP&L coal ash management strategy. PP&L burns about 8 million tons of coal ash -- I'm sorry, coal each year, making it the largest producer of electricity generated from coal in Pennsylvania. As a result, PP&L generates about 1 million tons of coal ash each year. Up until the mid 1990s, most of PP&L's coal ash was disposed of in captive landfills or surface disposal impoundments, constructed mainly on farmland and green space adjacent to the power plants.

In total nearly 1000 acres of land was

required for disposal of coal ash at PP&L's four operating coal fired power plants. Today, however, mine reclamation is a major component of PP&L's ash management strategy. Since 1995, PP&L has increased the amount of coal ash beneficially used in mine reclamation from 65,000 tons in 1995 to over 320,000 tons in 1998. The beneficial use of coal ash's mine fill has significantly reduced PP&L's coal ash handling costs. Also, due to Pennsylvania's mine fill initiatives, PP&L currently has no plans to build any more coal ash disposal facilities at its power plants. Working with the local public advisory committee, PP&L identified sufficient mine sites to reclaim with its coal ash that would result in the best balance of environmental improvement, public safety and cost savings to the company and to the public.

The dramatic increase in the use of coal ash as mine fill in Pennsylvania can be initially attributed to the 1986 amendment the Pennsylvania Solid Waste Management Act, that revised the

definition of solid waste to exclude coal ash that is beneficially reused or beneficially used. The act defines coal ash as fly ash, bottom ash, or boiler slag resulting from the combustion of coal, that is or has been beneficially used, reused or reclaimed for a commercial, industrial, or governmental purpose. The act goes on to define what constitutes a beneficial use, and includes the use of coal ash for mine subsidence, mine fire control, and mine sealing.

The 1986 amendment to the act is significant to coal ash producers who are now beneficially using coal ash as a product at mine sites as opposed to disposing of it as a waste material. In this case, coal ash is being beneficially used as mine fill in lieu of natural borrow materials or mine spoils which, in many cases, are absent at mine sites.

Surface mines. PP&L is dealing with surface mines. This, in a particular earlier presentation discussed -- two presentations discussed

barriers to the increased use of coal ash, and it's clear that in Pennsylvania this was one barrier to the increased beneficial use of coal ash that has been removed and really promoted this use.

However, this does not mean that the beneficial use of coal ash is unregulated in Pennsylvania. The amendment to the act gave the EPA the authority to establish standards and criteria for various beneficial uses DEP subsequently developed covering mine fill, which eventually were incorporated into the residual waste regulations which were enacted and adopted in 1992. Mine fill is also subject to the Surface Mining Control and Reclamation Act, and the Coal Refuse Disposal Act. Subsection H of the Residual Waste Regulations specifically sets forth procedures which must be followed for the conventional placement of coal ash at mine sites. Major requirements include ash delivered to the mine site must have a pH between 7 and 12.5, and cannot produce a leachate that exceeds DEP's class 3 limits, which the DEP has established

as safe for unlined natural attenuation facilities. Ash must be separated from the groundwater high walls, and other consolidated rock features. Ash must be delivered to the site within an acceptable moisture range and compacted in layers not exceeding two feet in thickness.

And lastly, groundwater must be monitored to show that not only is there no adverse impact, but also that the beneficial use results in an improvement. Since 1986, the DEP has issued over 80 permits for the conventional placement of coal ash at mine sites and has -- and in its reports, has not detected any significant off site groundwater pollution from the use of coal ash.

I understand that the Department of Energy is currently pulling this information together and will be submitting a report, a written report summarizing this data, and I also understand that the Department of Environmental Protection is also going to be submitting data to substantiate this.

While groundwater quality at mine sites may

take many years to show improvement due to the significant damage caused by absent mine drainage, reclamation activities have already significantly reduced surface water infiltration, and eliminated safety hazards posed by high walls and other dangerous features at the mine sites. The innovative nonconventional mine fill initiatives underway in Pennsylvania are being evaluated through the use of no cost contracts or demonstration permits, until it can be shown that the approaches are justified without compromising environmental quality. No cost contracts are also being used by other states for mine fill applications.

PP&L itself initiated a nonconventional mine fill project involving the reclamation of crop falls which posed a serious safety hazard in the anthracite region. Crop falls consist of long narrow openings resulting from the subsidence of abandoned deep mines creating almost vertical high walls of various depths. They represent significant problems because of their size, their depth, location and

numbers. And also due to the fact that there's no material available nearby for backfill. Current funding associated with reclamation of abandoned mine land does not typically allow these extensive crop fall areas to be reclaimed. Therefore, the only way these crop fall areas may be reclaimed is through the beneficial use of coal ash.

In conclusion, the environment is being well protected in most cases enhanced through the beneficial use of coal ash as mine fill in Pennsylvania. The ACAA and PP&L believe that mine fills should be left to the states to regulate based on state specific needs and priorities. I wish to thank EPA for holding these public meetings and allowing me to present our recommendations to the agency, and I'd be happy to entertain any questions you may have.

ANDREW WITTNER: Larry, you mentioned separation from groundwater as mandated from the state. Can you elaborate just a bit?

LARRY LA BUZ: For the -- again, I'm

speaking to the conventional placement of coal ash requires a separation, I believe, of 8 feet to the groundwater table, which must be accomplished by placement of any materials that are available nearby. This is -- no liners are required, just keeping a separation distance. So as long as you meet that separation distance, you can begin placing coal ash. There are -- and I would have to defer to DEP -- I do know that they are investigating direct placement of coal ash into the water table at some mine sites, and this would be one of those projects that they're evaluating under a demonstration permit. I'm not familiar with that but I know they're looking into that. But this would be one of those projects that they would be handling outside the Pennsylvania regulatory process until they have the monitoring data to show that it is a safe practice.

So in conclusion, the idea would be that the states are looking at this, Pennsylvania, in particular, is studying the safety of that particular

application.

RICHARD KINCH: I thought for your mine fill, you made a reference for mine filling and the operations that you selected to engage in mine filling, that you somehow pick the best sites.

LARRY LA BUZ: Yes.

RICHARD KINCH: Could you elaborate a little bit more on what factors help constitute what was a best site?

LARRY LA BUZ: We had at our sites some -- at our coal fired power plants, we were bringing coal in from an anthracite region, bringing anthracites and other coal sources. So what we did was we basically looked in a five-mile radius of those coal reserves what was available for reclamation, and we basically did -- established criteria to evaluate these sites, including public safety, hall roots, the particular site was what sort of groundwater degradation was occurring from the abandon mine land from acid mine drainage, and we actually solicited input from a public advisory committee who helped us with

this ranking process. And in this particular instance, this crop fall came to the top of this process mainly because of the safety hazards posed by the crop fall. Thank you.

THEA MC MANUS: Thank you, Larry. Next we have Barry Scheetz from the Association of Independent Power Producers.

BARRY SCHEETZ: Thank you very much for having us here today. My name is Barry Scheetz. I'm a professor at Penn State University. My actual title there is professor of materials, civil and nuclear engineering. I have degrees; my formal education is in geochemistry. And I have been on the faculty there for about 24 years. For this period of time, I have worked in various environmental applications, primarily with cement and consequently the use of fly ash in Portland cement. My activities for the past 10 years have concentrated on large volume uses of fly ash, specifically making cementitious grout out of the fly ash and using that for mine land reclamations. I'm here testifying on

behalf of ARIPPA. ARIPPA is a trade association comprised of 12 independent power plants, these are located in both the anthracite and bituminous region of Pennsylvania, and they have an additional five associate members in Pennsylvania and in West Virginia.

These power plants burn coal refuse waste. This is material that has blighted the landscape of Pennsylvania since before the Reclamation Act of '77, where you must go back and backfill. These power plants represent a total production of 886 megawatts of generation capacity and they have consumed, during the course of their operations, which is now about 10 years in Pennsylvania, they have consumed about 56 million tons of this coal refuse waste. They provide a very significant environmental benefit to Pennsylvania. They impact and improve the aesthetics. I'm a product of the coal region of the anthracite region of eastern Pennsylvania, and I was seven years old before I realized that snow was not supposed to be gray.

They eliminate mine drainage, they eliminate the materials for mine fires, they eliminate huge quantities of silt runoff because most of these column banks are unvegetated. And they eliminate very significant health and safety issues. Within Pennsylvania, the priority on the restoration using AML money, abandon mine lands money, is based upon occurrence of fatalities at site, and this group, ARIPPA, has a number of their participating members who are working specifically on sites where there have been fatalities.

The ash that's generated by these facilities is used as a sweetener, all of these facilities add lime to their fluidized bed in order to control the socks emissions so they will all run a slight excess of lime so that the ashes that come off have a higher pH. They have the lime content in them. That acts as a sweetener for soil restoration, in restoration of contaminated soil. It's also used either as a direct -- a neutralization component for acid mine drainage, and what results from these are

that the reclaimed mine sites are revegetated, and they are beginning to provide very valuable habitat for wild life. My two co-presenters here, Rufus and Larry, have presented a great deal of what I wanted to say, and they're going the hit the highlights of what I have here. So I'm going to repeat just a few of what I think are important points.

Our DEP has, as you just heard, 2400 -- or has indicated an inventory of 2400 miles of degraded steams. They have 252 miles of high wall which constitute an immediate and present danger to the inhabitants to Pennsylvania. They have 1200 mine shafts and ventilation shafts that are not closed, that are open and accessible the deep mines. We have 38 burning underground mine fires in Pennsylvania. And, of course, you'd heard that infamous 250,000 acres of unreclaimed mine lands in Pennsylvania. This is the largest single environmental problem in our commonwealth. 45 of the 67 counties in Pennsylvania are impacted by this. This constitutes just the mine lands, a $15 billion restoration

effort. The 2400 miles of stream constitute a $5 billion restoration effort. Waste piles of coal that ARIPPA is burning amounts to what we think is a very conservative estimate of 303 million tons of abandoned preact refuse that exposed upon the lands. In the anthracite region, there's 132 million tons, and the majority of the participating members in ARIPPA have consumed in the past ten years 56 of those.

Let me get to the issue. I'd like to in the remaining time I have, to address the risk assessment model. I'd like to give you some idea of what the use of this ash in mine land restorations, and these are surface mine restorations, has done, and then we'll draw some conclusions. In your previous reviews in '88 and '91, the EPA had used standards of release that were based upon the EPA 13-1. That's 100 times drinking water standard. From these standards, the arsenic released from fluidized bed combustor wastes would clearly pass -- all of the waste would pass those standards. In

fact, the vast majority of material that has come out of these wastes will pass the drinking water standards. Making a decision to regulate the fluidized bed combustion by-products in mine land reclamation, either under Subchapter C of RCRA, or a voluntary program is not appropriate, especially when we feel that the primary basis -- or primarily based on the risk assessment in modeling. We don't think that was well chosen. We think it's ill founded.

We believe that the decision to regulate fluidized bed combustion by-products under the Subchapter C, or under a voluntary purpose, will impact the overall program within Pennsylvania. Governor Ridge has announced a growing, greener initiative in Pennsylvania, which will expand reclamation, and he is specifically targeting -- this is the single most pervasive environmental problem in Pennsylvania. He's targeting it for restoration. The Pennsylvania Joint Legislative Air and Water Pollution Control and Conservation Committee have evaluated the use of these wastes products, of these

combustion wastes, and they have come back with an endorsement of them, for their beneficial use for these applications.

Those 56 million tons that ARIPPA have consumed of the gob have resulted in much higher than average ash, simply because the average BTU content is much lower but it has constituted the 2300 acres of restoration in that ten-year period of time.

Our concerns with your modeling are basically threefold, and I have a lot of detail here, and I'm only going to skip over these in deference to the time limit that we have. Your own evaluation of the modeling quotes that it fails to account for correlations that occur between parameters at a site due to physical relationships among soil properties and regional trends and climate and geohydrology. It's basic hydrogeologic -- students will learn that simulation of groundwater flows in a uniform flow, in a unidirectional flow path. When you apply that to very complex situations, it just doesn't work, particularly the complex geology that we see in the

folded Appalachian Mountains where the anthracite occurs where we have multiple aquifers that may be underlying one another with much varying different chemistries. Most of these complexes where we're talking about applying this material are -- geohydrology's controlled by complex interconnection of deep mining and drainage shafts into mine pools.

The second issue is the source term. And this is the one that -- we got five minutes, and this is the one that's particularly important. The source term is critical in modeling. You have to be particularly -- pay particular attention to the mechanism of release, how much material is there, the kinetics of release, and if you look at the model, we don't believe that the use of cementitious material -- that this ash constitutes -- was adequately modeled for the source term. This material is pozzolanic. That means that in the ash material in the presence of high pH will undergo chemical reactions that are cementitious. And I can go through the chemistry if you'd like that.

As compared to Portland cement, the compacted ash here will generate compressor strengths of 1000 to 4000 PSI. Redi-Mix that you use for your sidewalk gets to be 2500 or 3500 PSI. Because of the swelling action that occurs in this hydration product, we will routinely measure in the laboratory hydraulic conductivities of 10-6 to 10-10 centimeters per second, comparable to the capping material that you require for hazardous waste landfills.

The material itself will set up as a hard mass, and when you go to look at the component -- the metal release source term from this, you will find that you have a solid mass, not that loose fluffy fly ash that you expect. And if you look at some very simple calculations, back-of-the-envelope calculations, you can see that you can reduce by several orders of magnitude, in fact, seven orders of magnitude, 10 million times the surface area, and if you're exposing the same volume of water to that reduced surface area, you have to reduce leaching. It's the same thing you get when you try to dissolve

sugar into coffee. If you use a sugar cube, versus granulated sugar, versus powdered sugar, you will know that the powdered sugar dissolves fastest. Why? It has the highest surface area.

The same thing occurs for this, and your own verbiage in the various documents that were available to me for the preparation of this suggests that indeed, that was overlooked. There are a number of other assumptions in there, and I think I hit upon the most telling of them. Let me just very quickly hit the water quality data. The co-gen plants impact and the use of this ash impact water in four significant ways. The one that we're here to talk about today is the release of metals, and specifically in the document that we're addressing here was arsenic. The data from the ARIPPA memberships spanning ten years of operation have in their database 8,931 separate water analyses. And these show an improvement of water contacting the reclaimed mine sites. The pH of the contacting water is generally increased, the dissolved metals, iron

and manganese and arsenic are reduced, acidity is reduced, and generally, the reduction of arsenic concentration in water affected by the fluidized bed ash is typically in the range of a factor of 3 to a factor of 100.

Let me conclude now basically saying that there are quite a number of things. We think that your modeling was not adequate. We think your modeling seriously needs to be relooked at. I think your modeling seriously needs to look at the implications of the use of this ash as an aqua-tard, not as something that's going to let water permeate through it.

We would very strongly suggest that you abandon the course of action of trying to regulate this under Subchapter C of RCRA, simply because it is a very significant economic impact to the Commonwealth of Pennsylvania. And I think of behalf of ARIPPA -- and I'm going to extend an invitation to you -- if you're going to go to Indiana, take a shortcut through Pennsylvania, and we would be

delighted to lead you on a tour of the various facilities that we have going in the various demonstrations. The project that Larry talked about of ash placement in standing water, I'm doing. And I've done the one before that. We've done two in Pennsylvania, one where we've injected fly ash grout directly into a reclaimed mine site, and we've afforded a 90 percent improvement in water quality on that one. And the other demonstration is ongoing, but it's just outstanding right now.

ANDREW WITTNER: How do you feel about the eight foot separation distance which Larry spoke given -- we don't have any real problem, pozzolanic, cementitious and source terms kind of criticisms. We understood these things. And I think you were probably speaking of our -- when you say you reviewed our models, are you speaking of landfills or mine fills?

BARRY SCHEETZ: The mine fills.

ANDREW WITTNER: Okay. Well, that's -- you probably notice further down in the report that we

backed off that for the present. But given how you feel about the mobility of contaminants in this ash, why do you or do you not accept the need for 8-foot separation distance?

BARRY SCHEETZ: The demonstrations that we're doing right now are specifically being conducted to look at that. The eight-foot separations I personally don't think are necessary. We have not seen -- in the data that I've look at over the years, we have not seen the mobility of any heavy metals that would warrant doing that. But our DEP has taken what I think is a very aggressive leadership role, and I think is a model that ought to be looked at as a leadership model for how to regulate the use of ash. They chose that as a conservative issue.

We're addressing that situation right now with our demonstration. We're placing the ash into standing water. We have 140 million gallon surface strip pit that we are gradually recovering with this. And the metals in there are nonexistent. In

fact, the pH is elevated because of the lime that's in the water, but if it were not for pH, that pool would meet drinking water standards.

RICHARD KINCH: What's the timetable for that demonstration project?

BARRY SCHEETZ: The timetable on it is that it's been in progress for about two years. It's about a third finished. So we're looking probably at another four years before we -- before the pit is filled. Water is being collected on a monthly basis and on a quarterly basis by the DEP, so those data are being assembled, and I know that DEP is going to be presenting a written commentary to you. And that's going to be highlighted as one of the --

ANDREW WITTNER: That water is somehow contained or is it a pool?

BARRY SCHEETZ: It's a mine pool. It's connected to a mine pool, and it constitutes about 25 percent of the mine pool, but the mine pool's is interconnected only through deep mines. And we are monitoring upgradient, of course, and there are four

downgradient monitors, and then we're monitoring the outfall of that, where it discharges into the Schuylkill River. It is the head water of the Schuylkill River. And as I say, to date, there's -- you can drink it if you like the pH. It tastes a little soapy. Thank you. Please take us up on our invitation.

THEA MC MANUS: Thanks, Barry. Next we have Ron Hamrick from the National Mining Association and Anchor Energy.

RON HAMRICK: Going with the old adage that a picture is worth a thousand words in the 15-minute time limit, I brought a few pictures that I'll show you as we go on. What I'd like to present are three case histories. I'm the manager from Environmental Services for Anchor Energy Corporation located in Morgantown, West Virginia, and the three case histories that I'll be presenting are done by Patriot Mining Company, which is an operating subsidiary of Anchor Energy Corporation.

The operations that I'm going to be talking

about are in Monongalia and Preston Counties in northern West Virginia. Patriot first began the utilization of coal ash in 1990. And at that time, the ash back-haul was undertaken as part of a coal sales contract. Since that time, the ash utilization has been incorporated into the mining operation and remains the only practical way for meeting current permit requirements. The ash is used to stabilize and solidify other mine wastes and to produce -- and to reduce the potential for acid mine drainage in the northern West Virginia coal fields.

The three projects that I'm going to talk about demonstrate a number of different techniques in which the coal combustion by-products are utilized at these mine sites, and the by-products from the ash are from circulating fluidized bed boilers, which inject limestone with coal in the combustion bed. And resulting ash is highly alkaline and tends to harden and has a very low permeability content.

The first site I'd like the talk about is the Albright re-mine site. This is a premacrosite

located on the banks of Cheat River in Preston County, West Virginia, and it had been burning for a number of years. And this is a picture taken of the site from across the river at a site where the whitewater rapids put in, this is one of the parking lots and there's a large AMDC coming into the river directly across from this site.

This is a closer-up view of the site. You can see the sting smoke coming off of the burning refuse. In addition, there were three seams of coal that have been surfaced mined in this site leaving about 2500 feet of unreclaimed high wall and unstable spoil piles. The burning refuse is reclaimed by the West Virginia AML program in 1990, which eliminated exposed refuse in the air pollution hazard. But due to the extreme acidic nature of the refuse, seepage from this pile was still acidic with high metal concentrations.

A typical seepage quality was 1600 -- 16,700 parts per million acidity, loading rate of about 1300 pounds per day. Iron was 3,620,292 pounds

per day, pH was 2.7. And this discharged into the Cheat River, as I said earlier, directly across from where these whitewater rafting companies put in in the spring for their tours. Patriot has a rail car dumping facility located nearby where ash was brought in on the CSX rail line. From the outset of this project, it was Patriot's objective that the ash that was brought in by the rail would be used in totally eliminating the AMD discharge from the site.

Prior to any construction, we did an extensive engineering evaluation on all materials to be used in the field. Laboratory tests were conducted on the field materials to determine the strengths for stability. In addition, lab scale leach tests were done and coal refuse, ash and soil and rock from the site in various proportions in order the predict potential leaching of heavy metals from these mixes. TCLP was agent conducted on samples of ash.

Re-mining of this site began in June, 1994. The plan called for complete excavation of all

refuse down to original ground on the site. Numerous acidic seeps were intercepted with constructed underdrain which outletted into a perimeter diversion ditch around the site. Our original plan was to haul as much of this refuse as possible to a nearby refuse burning co-gen plant. However, due to the burning which occurred over the years within the pile, most of the BTU content was too small, too low to be used as the waste fuel, and therefore it was placed back in the field with the CFB ash. Upon completion of the underdrain, we placed a 6-to 8-foot layer of CFB ash on original ground as a liner system. Then above this, alternating layers of ash and refuse were compacted in the field. Layers of ash were typically 2 feet thick, and the refuse layers ranged between 2 feet and 4 feet in thickness.

A 14-foot wide bar of CFB ash was placed at the outer edge of the field to act as a drainage barrier. Due to the pozzolanic properties of the ash, this served as a barrier to surface water infiltration into the pile, greatly reducing the

amount of water that could potentially come into contact with the refuse post mining. This ash was then covered with 18 inches of soil when revegetated. From the beginning of the project, the alkaline nature of this ash has neutralized the A&D runoff seepage from the coal refuse. And typical post water discharges from this site, which I have in a table which I'll submit, they all meet the West Virginia water quality standards for arsenic, barium, lead, mercury and nickel. We've exceeded a 6 pH from all the ponds that we have on the site, and iron, manganese and aluminum values have been well below the -- even the technology-based ones which would be placed on a coal mining site.

We had a remine permit, so we were allowed to discharge above technology-based limits, but that never occurred due to the nickelization of the ash.

I have a couple of pictures showing an aerial view of the site during construction. And what it looks like today. The second site is the Stacks Run coal refuse processing project. This was

another re-mine site. It was originally mined during World War II with a small steam shovel which resulted in a series of narrow pits and steep soil ridges. And Patriot began utilizing abandoned pits in this area for refuse placement about 14 years ago.

The refuse is generated by a coal preparation plant owned by Patriot located in Kingwood, West Virginia. In late 1992, Patriot began excavating the refuse as fuel for a new co-generation plant constructed in Morgantown, West Virginia. The trucks that haul the refuse to the plant, back-haul CFB ash to the site and this ash is utilized as a liner and as a cap material. Typically the CFB ash has excess calcium carbonate equivalent of about 229 tons per thousand tons, which roughly says that it's about 23 percent limestone equivalent in the ash. Typically the coal refuse, which is being excavated and burned has a deficiency of calcium carbonate of about 48 tons per 1000 tons, which is highly prone to produce acid drainages. Most ash and coal refuse aren't mixed at

this site because the refuse is eventually going to be excavated and burned. Some refuse, however, is too wet to be compacted to meet requirements on the site, and this refuse is mixed with the ash which has a very high ability to absorb water, and the resulting mixture is stable enough that we can get proper compaction for the refuse going to the site. This mixture is stored separately because once the ash is mixed with the refuse, it can no longer be dug up again for use as a waste fuel.

I have a couple of photographs which basically show the site with the ash being placed as a liner and the refuse being placed on top of it. This refuse will eventually be excavated and burned in the coal burning power plant. This is a closer version, the light gray material being the ash and the dark material being placed on top of it is the coal refuse.

The third area that I'd like to talk about is the Morgantown area surface mines. The co-gen power plant which utilizes this refuse from Stacks Run

also utilizes coal from Patriot's Morgantown area surface mines. The coal and the refuse are then stored in separate silos at the power plant, and mix is needed to supply the proper feed into the boilers at the plant. The trucks that haul the coal from our surface mines return the ash from the back-haul. We're mining the Waynesburg coal seam and it's overlain by overburden that is very variable from an acid-base standpoint, and can quickly change from one pit to the next from a net alkaline to a net acid-producing balance in the overburden.

As a result, some of the historical reclaim sites have met effluent limits without treatment while other sites have required chemical treatment to meet effluent limits. And I'll have included a table when the paper that gives results of the acid base accounts from these sites.

CFB ash was first utilized as a reclamation amendment on our surface mines in 1993, and we have three principal uses for the ash, the first of which is a pit liner. Following coal removal, a six to

18-inch layer of ash is spread on the pit floor. Whenever possible, we like to have the trucks from the power plant place the ash directly on the pit floor following coal removal. When scheduling doesn't allow this, the ash is stockpiled and then hauled to the pits in 50-ton rock trucks, and then tracked in and compacted with a rubber tire front end loader. What this does is give the post mining groundwater flows in the backfill pits an alkaline surface to run over, rather than the coal pavement. There are areas where this coal pavement can be acid produced and we're going to try to have an alkaline layer for that water to run across rather than an alkaline acid and coal pavement. That's one of the loaders tracking in the ash into a pit floor.

The second use is a cap material. Following backfill when we regraded the areas to original contour, we placed a 6-to 36-inch layer of ash over the regraded area prior to topsoil placement. In addition to adding alkalinity into the backfill, this also reduces surface water

infiltration, thus reducing the potential for water to become into contact with the acid producing material in the backfill. And the final use of the ash is encapsulation of acid producing shale binders and roof rock that are associated with the coal seam that we're mining.

And typically, we prepare a level area over several feet of ash compacted on this area, then the refuse, or the acid-producing material are trucked on to this blanket and compacted on top of it, and then the ash is placed on top of that of that as a seal. And that's placed in the backfill of mine pits.

All sediment structures that we see run off from this area, from many of the mined areas that are reclaimed with ash are monitored quarterly for a number of heavy metals, including arsenic, lead, nickel, aluminum, barium and mercury. All of these concentrations from the surface mines have met West Virginia water quality standards with the exception of nickel, but we've found that the nickel has also been exceeded even in the background water quality,

which would indicate that this is a background problem unrelated to the ash utilization. I might add that I have additional data that will be submitted during the written comments, both on groundwater in the 13 sites that we currently have reclaimed in underactive mining where this ash has been utilized.

RICHARD KINCH: The person from Pennsylvania referred to an 8-foot separation to the groundwater table. Do you operate with any kind of requirement with regard to a separation to the groundwater table or the bottom of these pits below the table?

RON HAMRICK: What we are doing is we're intercepting various perched aquifers in the high wall, as we create the high wall for removal of coal. And in addition to any perched water that may be coming in from those high walls, we're going to have the infiltration water after the area's reclaimed, so our intent is to put that directly on the pit floor. So post mining, when the groundwater

table's re-established, there will be some groundwater that's established above the pit floors. However, our data is showing that we get much better post mining water quality from ash treated areas because that ash is running over the -- the groundwater is running over an alkaline surface as opposed to the natural, sometimes acidic pavements that are present in that coal scene. So we intentionally put it in contact with the pit floors. Thank you.

RICHARD KINCH: Dr. Scheetz, you think that's a good idea?

BARRY SCHEETZ: Yes, it is.

THEA MC MANUS: Thanks, Ron. You have a couple of pictures up here. Next we have Lee Daniels from Virginia Tech.

LEE DANIELS: Good afternoon. My name is Lee Daniels. I'm a professor of soil and environmental sciences at Virginia Polytechnic Institute and State University, AKA, Virginia Tech. I've conducted an active research program on

stabilization and reclamation of coal mine lands and coal processing wastes in southern Appalachia since 1987. So I'll be talking about coal surface mines and coal waste piles. I'm not talking about deep mine injection. Since 1990, a major portion of my research program has been focused on the beneficial reuse potential of coal fly ash in mine land environments. I also served as a scientific advisor to the Virginia Coal Combustion By-product Task Force and the Virginia Department of Environmental Quality during the development of our Virginia regulations for CCP management, which were adopted in 1995.

I also currently work with the Virginia Department of Agricultural and Consumer Services testing a wide range of industrial and municipal wastes and residuals for their reuse potential as either soil amendments lining materials and occasionally as alternative fertilizers. In short, I support the continued beneficial utilization of CCPs in mine land environments and certain other

agricultural environments for reasons which I will detail in the balance of my comments.

First let me focus on the potential for beneficial use. And clearly in Virginia, this is beneficial use. We're not talking co-disposal here. Our perspective is if we're using it in this environment, it is beneficial reuse, period.

We have 100,000 acres of coal mine lands, these are mainly surface mines, or what you might call strip mines. They're dominated by very rocky and frequently infertile mine soils. Actively permit a coal processing waste which are also known as refuse gob piles, slate dumps, comb banks, they've got probably 10 different names -- I'll call them coal waste here -- cover almost 10,000 acres in Virginia alone and are typically net acid-producing over time. Virtually every coal waste pile that I know of in the Appalachian coal fields is a net acid producing pile.

Since 1990, we have extensively researched the potential of back-hauled coal fly ash materials

for one, utilization as a topsoil amendment to improve mine soil physical and chemical properties; and two, as a bulk blended alkaline additive for offsetting acid mine drainage from these acid coal processing wastes.

Both of these beneficial use pathways for coal fly ash have merits as I will detail later. While there are certain risks to the utilization of CCPs in mine land environments, they can be effectively minimized through attention to site conditions and management practices, you've got to have a local focus looking at individual site that the conditions match to the CCP of interest. In my opinion, the latter problem just mentioned, that of acid mine drainage from coal processing waste problems is probably the most significant long-term environmental compliance issue facing the Appalachian coal industry today.

The only proven way to prevent acid mine drainage from the vast majority of coal wastes disposal fills is to bulk blend lime or other

alkaline materials with the coal wastes to an appropriate acid-based balance. The alternative, and most common practice of today is the long term treatment of the acid discharge at discharge points for many years, if not decades, if not in perpetuity. We have extensively examined the effects of bulk blending alkaline fly ash typically at rates of 20 to 30 percent by volume with extremely acidic coal waste materials, both in long-term leaching column trials, and in a field setting with moderately acidic coal waste materials. Our column leaching trials were running large diameter leaching columns about that big. They were a meter or so long, for over two years, under unsaturated conditions with a worst case coal waste material. There was a 4 percent sulfur material that folks said it was so hot, it just ran away from you. Very, very acidic material.

Untreated columns, those that got no treatment, quickly acidified to a pH of 1.8 with 10,000 parts -- 10,000 ppm iron in solution along

with a host of other metals at elevated levels. The color of those leachates was the color of these curtains. However, when we added alkaline fly ashes above 20 percent by volume, we completely prevented acid mine drainage over the two-year period study for a period of over two years for unsaturated leaching conditions. Similar application of fly ash to moderately acidic coal refuse in the field similarly suppress the metal levels and its elevated pH in subsurface leachates as monitored for over two years. Based upon these results and our review of other studies, we clearly support the utilization of alkaline fly ash bulk blended with a potentially acidic coal waste material to offset -- to prevent acid mine drainage. It is also apparent from our data and from that of a number of other researchers, that coal ash also has the potential to surface-absorb iron and other metals, significantly reducing their concentration in solution, via another mechanism in addition to the normal acid base balance effects I just discussed.

However, our data also indicates that it is critical to accurately estimate the amount of alkalinity required in the fly ash coal waste bulk blend to prevent the onset of acidic conditions over long periods of time. If the fly ash blended zone is allowed to acidify, heavy metals will be stripped preferentially from the ash and into the leachates greatly complicating an already negative water quality problem. Thus we do not recommend the utilization of non-alkaline ashes for this particular purpose, and weekly alkaline ashes may need lime additions to appropriately balance their alkaline loading to that of the potential acidity of the host refuse.

However, as I'll mention later, this is taken care of under the Surface Mining Act and most state acts in that you have to estimate the probably hydrologic consequences of what you're doing, and part of that is ensuring that in the zone of co-utilization, that acid base balances are met. In addition to acid neutralization benefits I just

talked about, we have also documented the fact that fly ash additions of 20 to 30 percent to coal refuse by volume can drastically reduce the rate of water flow or hydrogeologic conductance tend to, at times, 100-fold without increasing the net volume of the fill or decreasing the sheer strength of the blended and recompacted fly ash with coal waste. This drastically limits the rate of water and oxygen movement through these pyritic materials, cost waste materials.

Finally, our data also indicate that when a semi-pozzolanic ash is used in bulk blends, it is possible to effectively cement the entire zone completely limiting water and air movement through the coal waste, which is definitely beneficial. Coal fly ash can also be utilized as an incorporated surficial soil amendment to both rocky mine soils on surface mines and for the direct revegetation of acid coal waste. Utilization rates must be controlled by the bulk salt content of the soil ash mixture after incorporation, which may limit loading rates to salt

sensitive vegetation.

However, we have observed significant long-term plant growth benefits from that practice, presumably due to enhanced water holding capacity along with improved availability of certain nutrients as was talked about earlier.

Finally, I would like the speak in support of the recently developed regulatory framework for beneficial utilization of CCPs in the various states. In Virginia, for example, our regulation governing management of coal combustion by-products which is VR 672-20-20 exempts tested and its eligible CCPs from regulation as solid waste, when it can be demonstrated up front that they're going to be used in a beneficial use pathway or recycled for specific purposes. All such CCPs utilized have got to pass the TCLP test, and when soil applied or utilized in land reclamation or even in mine fills. They must be kept two feet above the seas in the water table, 100 feet away sink holes, wells, et cetera.

In almost all cases, utilization of CCPs on

coal mine lands falls under the requirements of the Federal Surface Mining Control and Reclamation Act of SMCRA, and result in state regulatory programs. In Virginia we have developed a specific set of regulatory guidelines, except for this purpose that are administered by the Virginia Division of Mine Land Reclamation.

Under these combined federal and state regulatory packages, a significant permit revision is required with full public notice, full estimation of probable hydrologic consequences to both surface and to groundwaters of the practice and enhanced water quality monitoring as deemed necessary. The PHC determination then mandates that acid-based balances be estimated and met in the utilization zone that the CCP properties much matched appropriate to the host environment and that the long-term geochemical stability of the system can be assured.

When CCPs are to be land applied in Virginia as a soil amendment to either abandoned coal mine lands that are out of permit or to agricultural

lands, a CCP must be specifically and tested and approved by the Virginia Department of Agriculture and Consumer Services and labeled for this purpose. Our current testing program for such soil amendment labeling includes extensive total elemental and equilibrium extract testing along with the greenhouse bioassay using the soils and crops of interest. To date, we have certified and tested several CCPs and various combined CCP waste residuals for use of oil amendments.

Overall it's my opinion that the existing federal and state regulatory programs as I just talked about do allow for, and in fact, require sufficient testing and appropriate management practices of coal fly ash and related CCPs when utilized in both mine land and agricultural environment. I do realize that state regulatory packaging vary but particularly on active surface mines. All states must comply with the minimum standards of the SMCRA program.

In summary, I support the continued

beneficial utilization of coal fly ash and other appropriate CCPs on surface mine lands. And I particularly support their use for neutralizing acidic coal or processing waste materials. CCPs used in this fashion must be tested, and the long term geochemical stability of the materials as placed must be insured. However, the net benefits from utilizing appropriate coal fly ash material to offset acid mine drainage production and to improve mine soil quality in the Appalachian coal fields are potentially very, very large.

And I will turn in a detailed and fully documented paper in support of this with all the references and data sets. And I can assure you there are extensive data sets available on the effect of putting CCPs in a mine backfill environment and what the long -- the effects are on water quality.

RICHARD KINCH: You mentioned doing some of these studies for a two-year period and also this long term geochemical stability must be maintained. And I was wondering if there were any other estimates

of translating from -- this works for two years to long term stability and what you or the state or others may mean by long-term stability.

LEE DANIELS: We actually ran one of the trials for three and a half years, but still, the time frames involved, I am convinced, that as long as we can accurately estimate the acid-based balance, there is a tremendous literature based on acid-base accounting and how to offset long-term acid mine drainage using that approach.

So I think as long as we can rigorously estimate, what is the alkaline loading of the ash and balance that against the acidity, that we're talking long-term, decades long effectiveness. The problem would be if you critically underload that alkalinity and if the system goes acid on you, then you definitely have problems. But again, we need conservative estimates of the alkaline loading from the fly ash, and it's a very simple procedure to do that acid base accounting at that point in time. And I believe that that is the long term solution. Thank

you.

THEA MC MANUS: Thanks, Lee. Next is Bradley Paul from the University of Southern Illinois.

BRADLEY PAUL: I would have to be different. I'm Dr. Bradley C. Paul. I'm a mining and mineral resources engineer from Southern Illinois University in Carbondale. I specialize in surface mining, reserve estimation and the management of utilization by-products. The work that I'm to be describing is mostly work that I have done myself. This work has been sponsored by organizations like the National Mine Land Reclamation Center, the Illinois Department of Natural Resources, the U.S. Department of Energy, and the Illinois Clean Coal Institute. And I give them credit for that support.

The coal that we have in Illinois was originally formed from plaque material and soils that settled in the bottom of ancient swamps. These materials were compacted. We mine them today. When this coal is burned in the power plants. The

carbonaceous material is burned away, and the residual soils basically become the ash that EPA is considering regulation for.

This particular graph compares some typical concentrations in soils and also in combustion ashes from the Illinois basin. What the data is basically telling you is what any coal geologist could tell you, and that is, that coal combustion ash is baked swamp dirt. It becomes kind of scary when you think that there are people who are saying that we need to have clay liners to protect us from water that has been in contact with clay soil. Moreover, the combustion process itself stabilizes a lot of the metals that are in here as illustrated by this particular graph comparing spoil material from Illinois mine sites with combustion residues from similar coals.

And the thing that I'd like you to note from this particular graph is that the spoil materials are, in fact, more active and more leachable than the coal combustion ash and that's not

surprising. If you stick half the stuff in glass, it's a very stable phase, it'll break down over geologic time only. There are a number of considerations in the Illinois coal field that provide a unique opportunity for placing these materials, natural hydrologic containment.

If you look, for example, at our Forsythe Energy Number 5 mine field site, the rock layer immediately below that kit has a natural hydraulic conductivity of 10-11 centimeters per second. Most of our coal deposits are underlain already by a thick layer of underclay for those people who like clay liners. If you look at -- Peabody number 10, which is an underground backfill placement, we did this for subsidence control. Our most permeable layer was a couple of feet above the coal seam. The fracture hydraulic conductivity of this particular site was 10-11 centimeters per second on the fracture zone.

In the Illinois coal layers, a blot of our brine layers are fairly close to the surface, about 100 to 300 feet down. And it's interesting to note

mother nature's testament to the lack of mixing. The salt is not getting up into the fresh layers above. A lot of these underground mines, when we place material, are going to be down in these brine layers already, and mother nature's already's given her testament that there is no way in heck that trace metals from this swamp dirt is ever going to get up to the surface and into your drinking water.

Little bit on the subject of underground backfills, and that is the Illinois, the Illinois coal basin you heard a lot of horror stories about the nightmares of acid mine drainage in Appalachia, our nightmare is underground mine subsidence. We have similar acreages available in Illinois coal basin.

In the past, when half of someone's house drops into a pit, you get to cry about it, but there's not a whole lot that you're able to do in that situation because of the cost of backfilling with traditional materials is going to run you about $60 per cubic yard of material placed, and unless

that's one very valuable historic structure, you can't afford to do it.

With the programs that we've developed for U.S. Department of Energy and a number of other people who have been working on similar schemes, we can put these materials into underground mines to stabilize against subsidence for under about $4.50 a ton. And changing the cost of this kind of work by an order of magnitude changes the entire world in terms of what we can do as far as stabilization. But remember, we're talking about sites that have natural hydrogeologic barriers already built into it. This stuff is not going any place.

They talked about and admitted that there were a lot of very beneficial uses of putting coal combustion ash in the mine sites; A fact that I echo also. However, there were indications that there might be such things as universally poor or bad practices. And one of the things that was hinted at as a universally bad practice was to put coal combustion residues in direct contact with groundwater.

Our Forsythe Energy Number 5 site is a closely monitored example of this sort. We placed 120 tons of material into a surface strip pit. The material consisted of approximately 90 percent of sulfite rich scrubber by-products stabilized with PC fly ash at a ratio of about 3.125 to 1. It also consisted of synthetic scrubber gypsum and it also consisted of some PC bottom ash as well.

Prior to placement of anywhere of this material, our state environmental protection agency put monitor wells upgradient and downgradient at the site for us, so that the downgradient wells would be 15 meters away from the edges of the field for us to monitor. We monitored the site for a full year prior to the placement of any material to collect background natural water quality data, and we also took water from the upgradient monitor well, and we used it for column leaching experiments on any material that was considered for that fill and ran those experiments for a period of three years to determine what the effects would be on the water.

We did extensive modeling at this particular site. This is an example on the kind of things we saw coming out of the column that we have since confirmed from work at the actual site and that is this material will suck the heavy metals out of the groundwater, not put them in. In fact the only things that we can really find coming out of the ash in contact with the real groundwater was boron and molybdenum, and after assessing whether there was anything downgradient that may be heard from boron and molybdenum, we went ahead and we placed a fill. What we found, we were going to use boron and molybdenum to trace the plume and help us to calibrate or models so that one of the products of this study was supposed to be a calibrated model that was actually capable of echoing some real world data.

We ran into a little problem. Soil sucked up all of the boron and molybdenum before it could get to our monitor well. 15 meters away we can't transport. We got 120 ppm boron in the doggone fill

itself and I can't transport it 15 meters. There no way in heck with any set of parameters that you can run in those models, to say that plume hadn't hit those monitor wells years ago. We've been monitoring this site for five years. It's not going anywhere.

Another thing that was asked about was well, what's going to happen when all the alkalinity is stripped out of the ash. We took some FDC ash and we had a nasty little acid, like, 2 million gallons of water, nastiest stuff I've ever seen in my life. At any rate, we took 160 tons of FDC fly ash and shot it directly into the water. The water consumed literally all the readily released alkalinity in this ash. We never got the pH above 3.5. This is what the metals looked like. Everything going down. There's more data where that comes from, but we were taking out a lot more metal than anything that could possibly been stripped out of that ash. Direct contact with nasty, acidic water. Plumes not going anywhere from this kind of stuff.

One of the special benefits that we got

from using the ash in this way is that only about half of the alkalinity is quickly and easily released and available. The other half is much slower released so when we took those precipitates down to the bottom of the lake, we basically stabilized them against any sort of rerelease. There are no other materials available to us in AML program that have those kind of time-released properties to them. Now it's great for us when we're doing acid mine drainage however. It can raise havoc with people's computer models. There's several things that need to be checked very closely in looking at a computer model assessment of risk. And I bring up these because some of these kinds of problems do, unfortunately, show up in the modeling that EPA has done for their risk assessment purpose.

First question, do the models assume a constant sort concentration? One of the things that you see when you a ASTM open column leaching, or a number of other tests where you stage and change the volumes of water, is by about the eighth or 16th core

volume, most of your trace elements are leaching at a concentration 1/10 of what you saw initially. If you do not decay the concentration over time, you're going to overpredict your plume. Unfortunately, this is a problem with the work that was done in the EPA assessment.

Does the model check for amount of trace elements available? Thank goodness the EPA models basically did check to make sure they didn't keep on leaching arsenic long after all the arsenic of the source was gone. So they did catch that one rather effectively. However, an associated problem with that is the assumption that virtually all of a particular trace element is available for quick release at an initial concentration. Remember that a lot of these materials are in glass phases they will be released over geologic time, not over human life spans.

The assumptions made in a computer model was virtually everything was readily available for leaching. In fact, according to the EPRI data and

data from most other places, you're only going to have about 10, maybe at the very best, an occasional ash will have 50 percent of some isolated mineral that you can release. Mostly it's more like about 10 percent. Unfortunately you plug into the model an assumption that everything is leachable, and you just made an order of magnitude error in terms of how much material you have. Please remember that the sensitivity analysis on the EPA study showed that this was the most sensitive parameter and most capable of following up a model risk assessment.

Finally, and this is something -- I teach oil reserve estimation. It's very difficult for me to same side of hysteria when I see somebody make a mistake like that. Most trace elements are highly lognormally distributed. The result is that when somebody goes charging in and starts taking straight numerical averages, and compiling data together, the upper tail outwires are going to pull your estimates way up. That's why you have to use geometric means. A lot of literature on that subject when you're

considering things like that. If you run a Monte Carlo simulation assuming a uniform distribution, when in fact your actual source is lognormally distributed, you're going to have a disaster.

Why am I so sensitive to this sort of thing? In the mining industry, a lot of the things that we try and mine are available in only trace amounts. If you go charging after a mineral deposit thinking that you're going to mine it and make a fortune, even though there's nothing wrong with your samples, if you do not handle that lognormality, you will overestimate your income, and we've learned in the school of bankruptcy what happens to poor dumb fools that do things like that.

In the risk assessment process here, EPA is considering the cost of, and the benefit benefits available. You're basically looking at the same problem we are. Your earnings are measured in something other than dollars. They're measured in risk from exposed populations, but it's the same problem, and you're going to have the same result if

those lognormal distributions are not accounted for. And according to the appendices of the risk assessment documents, they are not.

Finally, problems in the area of economic assessment. In terms of the cost, they looked at the size of the industry considering combined generation transmission and distribution systems. In the world of deregulation, everyone knows a generation is going to be separate from transmission and distribution. Result: The regulated entity has only 40 percent or less of the income that was originally being projected in the study. They used a 40-year amortization period for the capital cost associated with their facilities. A coal combustion power plant has a life span of about 50 to 60 years and a lot of the facilities were already talking about 30-year old power plants. They don't have enough life left for some of the things that are assumed.

Finally, they considered only the cost of management at the site. You heard it mentioned several times in testimony given here today about

people back-hauling. That's because back-hauling is one heck of a lot cheaper than front hauling materials. There is a big cost difference if you wind up banning mine fill types of applications.

Put it all together. Take a look at it, and what you're talking about doing is knocking out 40 to 80 percent of the bottom line of affected generating entities. Not only would that effect the viability of coal combustions, you're talking about taking out entire companies. Including at the 80 percent end, it just so happens that my rural electric cooperative looks like exactly like your small power plant example in terms of size and everything else.

In summary, then, coal combustion ash is old swamp dirt. It improves mine reclamation in a variety of ways. It can and has been put in direct contact with groundwater without adverse effects. It can and has been placed in direct contact with acid mine drainage without ill effects. The risk assessment model drastically overestimates things

that are major problems with the probability distributions. The cost impacts are underestimated. There are a lot of things that are unique and available at local sites. The state regulator know these. They know how to handle them. They can deal with the difference between the midwest and Appalachia. Let the state regulators control the practice of mine filling. They're doing a darn good job. And in conclusion, don't be afraid of the dirt.

THEA MC MANUS: Thank you Dr. Paul. I think we should take a ten-minute break. It's about 10 of 3:00. Why don't we resume at 3:00. And at that time, Sean Griggs will be giving his presentation.

(A recess was taken.)

THEA MC MANUS: We have four more presenters this afternoon. Sean. We have Sean Griggs from Indiana Electric Association.

SEAN GRIGGS: Good afternoon. My name is Sean Griggs, and I will be presenting comments today on behalf of the Indiana Electric Association, or

IEA. The Indiana Electric Association is comprised of five member companies including Northern Indiana Public Service Company, Synergy, Indianapolis Power & Light, American Electric Power, and southern Indiana Gas & Electric Company.

Collectively, IEA's members supply electric power to several million residential commercial and industrial customers in Indiana. IEA appreciates the opportunity to express its views on the important issues outlined in EPA's Report to Congress on waste from the combustion of fossil fuels. The EPA administrator and her staff are to be commended for the comprehensive evaluation that has already taken place with respect to many of the issues addressed in the Phase II report. IEA supports EPA's tentative conclusions that coal fired, utility co-managed wastes should remain exempt from RCRA Subtitle C regulations and that most, if not all, beneficial uses of these waste should also remain exempt from Subtitle C regulations.

IEA's comments will focus on the beneficial

use of coal combustion products as mine fill. IEA believes one, that the replacement of coal combustion products back into the mine environment poses little or no potential risk to human health or the environment; two, that such practices are currently subject to industry waste management practices in state regulatory controls that are both adequate and effective; and three, that Subtitle C regulations would not effectively address the issues associated with CCP placement in mines at reasonable cost.

While my comments will focus on the mine fill issues that I just outlined, IEA's review of the administrative record compiled to date in this proceeding, indicates that several Indiana sites have been suggested as so-called damage cases. IEA believes that these characterizations are highly misleading. Time permitting, I will address some of the Indiana sites about which concerns have been raised to EPA by the Hoosier Environmental Council.

First, the replacement of coal combustion products back into the mine environment poses little

or no risk to human health or the environment. There is substantial scientific evidence demonstrating that Indiana CCPs produced by co-burning and co-managed operations are not hazardous. A joint study of Indiana coal ash conducted by the University of North Dakota Energy and Mineral Research Center on behalf of governmental industry and environmental interest groups including Hoosier Environmental Council, concluded that none of the CCPs tested in the study was hazardous using any leachate testing method. Even though CCPs pose no risk to human health and the environment. The tangible benefits of placing CCPs back into the mine environment were very substantial and should be preserved, even encouraged in EPA's final regulatory determination.

The following benefits have been identified even today. One, the natural alkalinity of CCPs can mitigate the negative environmental impact caused by acid mine drainage. Two, CCPs are similar in composition to the natural materials found at mine sites, and are therefore ready acclimated into the

subsurface environment through adsorption, attenuation, dispersion, and dilution processes.

The CCP placed as mine fill will represent only approximately one percent of the total disturbed material at the mine site. Three, the post mining environment is already disturbed by the coal extraction process. By using CCPs for mine fill, the need for additional, undisturbed greenfield areas where CCP storage and disposal can be minimized. And fourth, the use of CCPs as mine fill will minimize the need for borrowed materials required for mine reclamation activities performed pursuant to surface mining control and reclamation act regulations.

The direct benefits to the mining environment specifically, and indirect benefits to the broader environments in general, far outweigh any negligible risks posed by CCPs that are used as mine fill. EPA's Phase II regulatory determination should strongly encourage responsible reuse of CCPs as mine fill.

Second, CCP storage and disposal practices

including mine filling are currently subject to industry waste management practices and state regulatory controls that are both adequate and effective. Indiana's electric power generators have been proactive in addressing environmental concerns associated with CCPs. Although industry landfills and ash storage areas were constructed in compliance with all applicable laws and regulations at the time they were built, some of which were built in the 1950s, some environmental concerns have arisen.

I want to be as clear and candid as I possibly can on this point. Some CCP storage and disposal sites in Indiana have released contaminants above background concentrations into the environment. These few sites, however, are atypical and are not representative of CCP sites in general. In those isolated instances in which peculiar circumstances have resulted in minor environmental impacts, the materials disposed of and the placement practices followed are not representative of current industry practices and materials. A few Indiana CCP

landfill sites have undergone, and are currently undergoing corrective actions on either a voluntary or state agency directed basis. These corrective actions are required by state landfill regulations whenever a release exceeds background concentrations.

In some instances, old CCP landfills are being capped or leachate is being collected, even though these protected measures were not required when the landfills were originally constructed. Today, any new construction or major modification of a CCP landfill is subject to state regulations that require the utilization of liners. At minimum, all Indiana CCP landfills are being monitored to insure that any problems are identified in a timely manner. In Indiana, the nearest groundwater monitoring wells at CCP landfills are placed within 50 feet of the disposal area boundary, compared to the 150 meters required by federal Subtitle D regulations, nine times closer.

In short, Indiana disposal sites are in

full compliance with applicable state and federal regulations including, when necessary, corrective action requirements. With respect to mine placement of CCPs, Indiana requires that all proposed for disposal be characterized using bulk analysis as well as short and long term neutral leach test methods. Furthermore, an extensive characterization of the site, a hydrogeological study and groundwater monitoring around the CCP mine fill area is required for each permit issued.

Since 1992, Indiana has operated under a policy memorandum governing the use of CCP as mine fill. In 1998, formal rules were proposed and preliminarily adopted by the Indiana Natural Resources Commission. Final approval of these rules as subsequently amended is expected late this year.

In addition, the Office of Surface Mining, Indianapolis field office, accounted a study in 1997 to determine whether the Indiana Division of Reclamation was "properly administering their surface mining program responsibilities by requiring all

operators to develop effective handling, disposal and monitoring plants to insure the protection of hydrogeologic balance."

After reviewing all 13 mine permits that didn't allow the placement of CCPs at mine sites, the OSM study concluded that Indiana was properly administering the placement of CCPs.

In response to a question posed earlier by Mr. Wittner, I would like to say a word or two about whether mine placement is disposal for beneficial use. In Indiana, it depends. Certain applications, particularly subsidence control, are considered beneficial use, whereas the placement of CCPs simply for reclamation, that is, to fill the hole, is disposal under Indiana's program. IEA believes these distinctions are arbitrary and undervalue the indirect environmental benefits of using CCPs for reclamation.

Do perceptions make a difference? Definitely yes. The beneficial reuse of CCPs excluding mine placement for reclamation which is not

considered a beneficial use in Indiana, declined by 25 percent as a result of Indiana's characterization of FFC products as coal combustion waste. Waste is a word with bad connotations, and the choice of descriptive terms like disposal versus beneficial use by EPA, will have a very significant impact on public perception regarding these materials.

Indiana's experience with CCP placement in mine environments over the last seven years has demonstrated that the combination of industry waste management practices and state regulatory controls are adequate and effective to address any potential environmental concerns. A summary of the Indiana regulatory perspective written by Mike Sponsler of the Indiana Department of Natural Resources, is being submitted with my comments today.

Third, Subtitle C regulations would not effectively address the issues associated with CCP placement in mines at reasonable cost. Subtitle C regulations provide uniformity and consistency in the management disposal of hazardous waste. CCPs are not

hazardous wastes and do not pose the type of risks that associated with other federally regulated hazardous wastes. Each mine site is hydrogeologically complex and unique. Each mine site has numerous site specific issues and considerations that must be evaluated to determine whether and how mine filling should occur at a particular site. In Indiana, such determinations are made by the Indiana Department of Natural Resources during the mine permit approval process.

By considering the placement of CCPs into mines in a wholistic fashion at the permitting stage, adequate evaluation of site specific factors can be made on a case-by-case basis. In addition, the benefits of placing CCPs back into the mine environment to address acid mine drainage and subsidence issue can be intelligently planned for the maximum beneficial effect.

The need for case-by-case analysis strongly suggests that blanket federal regulation is not the most efficient or best approach. IEA also has

concerns about the cost effectiveness of implementing any Subtitle C regulations with regard to the use of CCPs in mine fill applications. Until specific regulatory alternatives are proposed, the ultimate economic impact could not be reasonably evaluated. However, the economic incentives for using CCPs as mine fill are marginal due to the significant transportation costs and regulatory compliance costs that are currently in place. And any additional regulatory burden could easily tip the balance away from using CCPs as mine fill.

THEA MC MANUS: Any questions?

SEAN GRIGGS: I did, if I could have one more minute, to address two specific sites that Mr. Stant brought up this morning. A third site that he brought up, I understand EPA representatives will be visiting next week, and I will leave it to you to make your own determinations about that site. But I think in fairness to these sites, I should say something about them. The two sites that I'm going to refer to are the Schaffer site and the A.B. Brown

site in Indiana. They have been indicated as having significant environmental concerns and that EPA should pay special attention to these sites in reaching its final regulatory determination. Mr. Stant's suggestion that these particular sites are somehow representative of CCP storage and disposal sites is simply wrong. I will try to set the record straight as best I can.

Both Schaffer and A.B. Brown are on site landfills that placed FGD materials from a dual alkalized scrubber system. This type of FGD material is unique to these two sites in Indiana, and perhaps in the country. Schaffer converted its dual alkalized scrubber system in late 1997, and that means it no longer makes this particular material, and now makes material that is wallboard grade gypsum. In addition, only localized monitoring wells, two of which are placed at the waste boundary, show any contamination.

Monitoring wells placed further from the waste but within the site boundary show no contamination

whatsoever. Most importantly, one half of the affected landfill was capped in 1998, and the other half is being capped this year with a composite membrane. The Schaffer site is not a typical site and is not representative of CCP sites in general or mine placement specifically. A.B. Brown also uses a dual alkalized system that produces wallboard grade gypsum. Since at least 1996, all new FGD material produced, that is, 100 percent, has been reused for beneficial and profitable use. To address the material that was historically placed in this landfill, the operator voluntarily installed a slurry wall to capture any contaminants. However, it appears that contaminants have been trapped outside the slurry wall with a slope back towards the wall and have been continued to be monitored by the monitoring well since the slurry wall was installed. Therefore, there is little -- it's clear why there has not been a reduction in the level of contaminants at this site. The same groundwater is being sampled over and over again. The operator is currently

pumping these wells to eliminate the pooled, or preexisting water, and we're confident that the contamination about which concerns have been raised will be eliminated.

In any event, the Schaffer and A.B. Brown sites are historic landfill sites that applied atypical CCPs. They are simply poor candidates as case studies for making generalizations for CCPs. Thank you.

ANDREW WITTNER: Why do you say these was unique, and what do you mean by that? Are they the only two in the country with respect to what they are generating, apart from the disposal practices?

SEAN GRIGGS: They are definitely the only two in Indiana. We are unaware of any others in the country that have used this particular scrubber technology. It results in relatively high salt concentrations, and many of the contaminants that are being complained about are salts, not metals. In one case, the site has ceased using this particular technology to recover sulfur, and the other one they

have found a clear beneficial use of the material, and are selling the material into the marketplace.

THEA MC MANUS: Thank you, Sean, for that presentation. Next we have William Miller from the University of Georgia.

WILLIAM MILLER: Good afternoon. My name is William Miller. I'm a salt scientist at the University of Georgia in Athens, Georgia. I'd like to address two different topics, I guess, in my time this afternoon having to do with my experience with fossil fuel combustion wastes, particularly my research experience over the past ten years working with different fossil fuel combustion waste, specifically with fly ash and with flu gas desulphurization gypsum. And say a quick word about the risk assessment contained in the Report to Congress which has already been discussed to some degree.

About ten years ago we started working with a group at the University of Georgia. With Georgia Power Company, with Southern Company, the major power

producer in southeastern United States looking at a by-product gypsum material that they were producing under a clean coal technology program. It was a relatively pure gypsum material. They were looking for beneficial uses besides wallboard, and we began applying gypsum to soils in the southeast, which are traditionally low in calcium and need additional calcium source. Actually, besides commercial limestone, gypsum has some special properties that make the calcium more soluble, more liable to move within the soil profile. And what we found is some very beneficial effects, land application of rates from three to five tons per acre of gypsum, really just a single time application. When we measured yields of alfalfa and also row crops, even five or ten years later, we get very large increases, in some cases, in yields of these agricultural plants.

After a five-year study we found no adverse environmental impacts of applying this gypsum material. It was very pure, had a very low metal content. And even gypsum material that had roughly

50 percent fly ash mixed into it due to the fact that they would turn off the electrostatic precipitators and collect the fly ash in the desulphurization vessel, that material also had the same beneficial effects on crop growth, and even though there were higher levels of contaminants obviously in that material, there was very little environmental impact.

We measured uptake in crop plants of a range of regulated trace metals. We measured movement of these materials through the salt profile, and were unable to find significant, environmentally significant differences between untreated plots and these treated plots. So we believe flu gas desulphurization gypsum has a real place in production agriculture in the southeastern United States, particularly for leguminous crops that have a real high calcium demand. It's a high calcium material.

About five years ago, we started another project, this time working with EPRI to look at a range of fly ash materials mixed with other types of

wastes. The idea here is that we would take fly ash samples, mix them with organic wastes, and custom blend fertilizer materials that would be able to have specialty uses within the agricultural and horticultural markets. We mixed fly ash with sewerage sludge, with different kinds of animal manures, we palletized it, we did all kinds of new and creative things with it to try to produce products that could be marketed for soil amendment in production agriculture formulated as potting mixes for horticultural production, and also use in mine land reclamation as top dressings for some very rocky soils that were difficult to revegetate due to the limited water-holding capacity.

The results of that experiment and all of this is detailed in my written report which will be submitted to the docket, is that even though fly ash has a -- probably a more limited range of beneficial effects for crop growth and for soil properties, there were still some definite yield increases, we were able to blend the materials that could be used

as fertilizer substitutes, and that were definitely beneficial in terms of specialty applications. We had some very good results with horticultural crop growth, making synthetic potting mixes, using different kinds of ash materials including bottom ash, and were able to show that again, environmental impacts were quite low for most of these ranges of ash materials. We had 25 different ash materials that we evaluated.

Now ash is a very, variable material. We had some ashes that were very low in contaminants; some that were relatively high. Obviously, this is related back to the kind of coal that's burned. And when we look at land application of ash materials, certainly we feel like one needs to look carefully at the composition of the ash that's going to be applied and not simply blanketly say a certain amount of ash can be applied without some reference back to the level of contaminants and also the level of nutrients and the physical condition of that ash has to be considered in terms of the value of that material in

an agricultural setting.

We did some work on the economics of this. Certainly there is some fertilizer substitution value in the horticultural market. This material has definite value because of the high cost of many of the potting -- components of potting mixes. And eventually we feel that fly ash will have a definite market value in an agricultural setting.

With respect to some of the environmental issues, and specifically the risk assessment that was performed in the Report to Congress, Dr. Chaney, I think, mentioned that many of the assumptions in the risk assessment probably are flawed and that that really needs to be re-examined in light of some more realistic estimates of some of these parameters. The idea that a child eating a gram a day, 365 days a year of soil, almost up to the age of 18 years old, that is the scenario that's limiting our ability to manage soils out in the field. That risk pathway really needs to be examined to make sure that we know what the distribution of those children are, what the

actual consumption is, and what the risk is to that population of children.

I think the idea that the background soil levels in many cases lower than the EPA hazardous level has already been brought up. We have many soils in Georgia that contain 20 to 30 ppm arsenic due to either natural background levels or due to the fact that they've have arsenical pesticides applied to them, so that probably constitutes a risk, but I think we need to balance that out and try to see if children really are at risk from those kind of levels of arsenic.

The biggest factor in the risk assessment, the way I look through it, is that EPA probably needs to more clearly define the scenarios that are actually being considered, how do these children actually get exposed to this soil, to find the distribution of values that are likely to occur for variables like ingestion rate, exposure duration, and things like that that may be less than exactly realistic. And the idea of using high end and

central tendency concepts probably needs to be relooked at. Some of these central tendency values seem to be more like high end values in many cases.

My personal feeling is that some guidance probably needs to be supplied by EPA for the agricultural use of these kinds of materials, particularly given the fact that many of these materials have a very wide range of contaminant concentrations. Again, we've had some ashes that are as low as a few ppm in arsenic, some are up above 400 ppm in arsenic. You cannot simply say that a certain application rate is acceptable and another rate is not acceptable. We certainly have been using the 503 B regulations as a way to gauge whether we're high or low on contaminant levels. It is only arsenic that really that ever bumps against the ceiling. Most of the other contaminants are much lower than that.

The chemistry of arsenic in a fly ash material is much different than it is in sewerage sludge. So in terms of applying 503 B regulations to inorganic wastes like fly ash, I think that has to be

evaluated really on a metal-by-metal basis, to make sure that the kinds of chemical reactions occurring in an ash material can be understood in a way that we realize the difference between that chemistry and what's going on in an organic mixture like sewerage sludge. And I think that can be done, there's enough expertise out there to be able to do that. And if that's done, I think these materials can be used safely and effectively and represent a resource in agriculture that can avoid the cost of landfilling, and probably substitute for a fair amount of fertilizer and other inputs into agriculture. Thank you.

THEA MC MANUS: Thank you, William. And next we have Dorothy McGlincy from the U.S. Generating Company.

DOROTHY MC GLINCY: There's only one more after me. We can do it.

Good afternoon. I appreciate the opportunity to submit comments to the Environmental Protection Agency on the Report to Congress. My name

is Dorothy McGlincy. I'm a licensed site professional in the Commonwealth of Massachusetts. I work for U.S. Generating Company providing technical support to our plants on waste issues, hazardous materials and remediation activities.

Throughout our affiliates, U.S. Gen owns and manages a portfolio of 30 rating plants and contracts that comprise 7,700 megawatts in 10 different states. Our company produces electricity from a variety of sources; coal, oil, gas and hydro. U.S. Gen is wholly operated, owned by PG&E Corporation, a national energy services holding company based in San Francisco whose business encompasses power generation, natural pipelines and liquids, wholesale energy trading, retail energy sales and regulated utility services.

Now back into the comments. More than half of U.S. Gen's plants could be directly impacted if ash management activities were regulated under Subtitle C of RCRA. We commend EPA on the comprehensive nature of the Report to Congress. In

general, we agree with EPA's determination that the electric power industry has a significant level of installed environmental controls for managing wastes that were studied in the report.

The majority of states have regulations controlling ash management. There are extremely few cases of documented damage cases associated with management of wastes that were studied, and the ash typically does not exhibit characteristics of hazardous wastes. U.S. Gen support's EPA's preliminary determinations to retain hazardous exemptions for fluidized bed combustion wastes; the co-management of coal ash with all things studied in the report; the co-burning of coal with other fuels; the burning of petroleum coke, non-utility combustion waste, and natural gas combustion waste.

We strongly encourage EPA to finalize the hazardous waste exemption for these wastes. We also urge EPA to consider information presented during the comment period to re-evaluate your position concerning the use of ash in mine filling, mine

reclamation, agricultural uses, and in oil ash management activities. We believe that in posing hazardous waste regulations on ash management will have a far greater impact to economics than those outlined in the Report to Congress. And it may have significantly impacted the environment by preventing mine reclamation in the United States.

The following testimony pertains to fluidized bed and oil combustion wastes and the management of those wastes used by our company. U.S. Gen will be submitting comments on or by June 14,1999 to support this testimony. U.S. Gen affiliates operate two waste coal circulating fluidized bed, combustion, electric generating facilities in Pennsylvania. U.S. Gen has reclaimed more than 770 acres of the abandoned coal mines in the past six years.

Our Pennsylvania plants have been recognized specifically for their mine reclamation activities through awards received from the state of Pennsylvania and from the Office of Surface Mining

for their environmental excellence. We are a member of ARIPPA, and Barry Scheetz's comments were some that we helped contribute to.

Based on the operating experienced to date, U.S. Gen believes that fluidized bed combustion ash provides significant benefits to the environment and to the economy. The operations have already been described. We remove excess fuel from the abandoned mines, we take it to the power plant; we burn it with some limestone for acid gas controls, then we take the alkaline ash back to the mine site; we actually operate our mine sites in Pennsylvania and we compact it greater and put a top cover of soil, grass and other vegetative covers. The work's done in accordance with Pennsylvania DEP requirements.

Included in an appendix of today's testimony, are some photographs of before and after sites -- photographs of our sites. Our ground water and surface water monitoring data for these sites in Pennsylvania show improvements in water quality at the abandon mine reclamation sites. Groundwater and

surface water quality are monitored for approximately 25 metals and inorganics on a quarterly basis, and the data regularly provided to Pennsylvania DEP. Water quality improved for a variety of reasons we've been discussing, but we've actually seen it at our sites. We believe this is because there's a reduced loading of total dissolved solids, and of metals and water leaving the strip mine. The ash, because of the pozzolanic characteristics, sets up like a cement providing the structural stability and minimizing infiltration which helps generate the acid mine drainage.

U.S. Gen will submit additional data from our mine reclamation sites in our formal comments, but I've also included some actual data showing graphs of increased pH from seeps at our sites and some other information with today's testimony. There are economic benefits resulting from the reclamation of mines. The reclamation of the mines is done at no cost to the taxpayer, to state or federal agencies, and the reclamation benefits the development of the

local community. Abandoned mines don't provide any commercial value to the community, and if you've ever been in these areas, they really are an eyesore and pose a significant safety to the community.

One of the ways -- another way that waste coal facilities benefit the environment is the way the clean energy from these brand new plants has its state-of-the-art technology that's used at these plants. If mine reclamation using FBC ash was not an economic viable alternative for utilizing our ash, then it will be extremely difficult for these plants to stay in business. As a result, not only would mining sites remain blighted, they would not become commercially viable properties and acid mine drainage would continue unabated.

The energy supplied by the waste coal facilities, if they were to go out of business, would likely be supplied by older electric plants that have less effective emissions, and emissions control technologies. Additionally, the waste coal facilities in Pennsylvania were financed in part by

state sponsored industrial revenue bonds. Adverse action to FBC ash could have a significant impact on the financing community and on future state economic development activities.

In summary, these waste coal projects and their reclamation of abandon mine sites are a significant part of the state's program to redevelop brown field sites, provide jobs and financial infusion to the local economies. The power plants provide clean electricity, reduce acid mine drainage and improve safety at the mine sites, all at no cost to taxpayer or government funds. Again, I reiterate that our data do show these points.

The next topic I would like to go into pertains specifically to oil combustion waste. U.S. Generating Company has two facilities in the Commonwealth of Massachusetts that uses fuel oil for generating electricity. Based on our experience, and our predecessor who were utilities, over the past 20 to 30 years, U.S. Gen has found that industry practices have significantly proved on the management

for ash management, specifically, oil ash storage and disposal. State regulations have firm control over this activity. Oil ash management activity should not be regulated under hazardous waste regs because adequate regulatory controls are already in place. And I'd like to give you a brief overview of our operations. The two U.S. Gen oil combustion sites were actually described in EPA's March '99 Report to Congress, although there were one of two items we'll be specifically contesting, our ash has not been used for -- our oil ash has not been used for structural fills. Nonetheless, the other information in there is correct. We have four water treatment basins that manage oil combustion wastes. Three are lined and one is unlined at one of our facilities. On a second plant that burns oil, we manage oil combustion waste in four unlined water treatment basins. These are all small -- half acre at the most -- basins. Both of our oil sites are regulated under state groundwater discharge permit programs. Both have monitoring wells around the unlined basins to

determine groundwater quality. The wells are monitored on a quarterly or monthly basis for inorganics, metals and organic compounds. In some cases, we have more than 20 years of groundwater quality data for our sites.

There are no drinking water receptors impacted by these sites. And in the event that there were unacceptable impacts to human health or the environment from our unlined basins, U.S. Gen would take appropriate actions to mitigate any unacceptable risks. U.S. Gen, in addition to these unlined basins which were certainly remarked about in the Report to Congress, we have, on site, lined oil ash landfills at one of our properties. They're relatively small; we have nine closed facilities. They're both lined and closed cells. They're capped with PVC, and we have two active double-lined, oil ash landfills at the site. We have, in that case which the landfills which is ultimate disposal for our ash, we monitor the groundwater around those landfills for metals, inorganics and selected organic compounds. We also

sample the interstitial leachate between the two liners.

What we found is that there is no significant risk to human health or the environment from our ash management facilities. We find that Massachusetts regulations require sampling and reporting on surface water, groundwater and soil quality at our sites. Ash management activities are controlled by a host of different regulations, including the groundwater discharge permit regs, the solid waste regulations, Massachusetts site assignment regulations, Massachusetts contingency plan regulations, which pertained to uncontrolled releases of hazardous materials, and the National Pollutant Discharge Elimination System. We have -- all of these permits are in effect at our sites.

We do not believe that oil combustion waste should be regulated as hazardous waste. As EPA notes in volume 2 of the Report to Congress, oil combustion wastes typically do not exhibit hazardous waste characteristics, and we have certainly seen that on

our site. In addition, there's little evidence that there's unacceptable risks associated with current industry practices. There is also not the weight of evidence from our sites nor other sites to warrant regulation of oil combustion wastes under Subtitle C.

In summary for oil combustion waste, managing them as hazardous waste is inappropriate because there's a very small volume of fossil fuel combustion waste that are generated, our oil ash managements sites are located at close-to-surface water bodies. There are no drinking water receptors at or near any of our oil ash managements sites. There's a significant amount of groundwater quality data for our sites. And we do not see any adverse impacts to the environment. Continued monitoring will keep our facilities in compliance with the state regulations, which have more than adequate control over our activities.

In conclusion, we support EPA's preliminary determination to retain the hazardous waste exemption for

fossil fuel combustion waste described in the 1999 Report to Congress. U.S. Gen also urges EPA to retain the hazardous waste exemption for oil ash and beneficial uses of ash use in mine filling, mine reclamation and agricultural uses. Thank you for the opportunity to submit these comments.

THEA MC MANUS: Thank you, Dorothy. And James Myers from USWAG is our last speaker.

JAMES MYERS: Good afternoon. My name is Jim Myers, and I'm representing the Utilities Solid Waste Activities Group today. I promise to be very brief. But I would like to briefly touch on two issues that were raised today. USWAG and myself was surprised to hear claims of earlier speakers that this report came as a surprise, and they're asking for an extension of the common period and the regulatory deadline, regulatory determination deadline. I've been working on this issue for the past 10 years and have interacted with the Hoosier Environmental Council since 1992.

Hoosier Environmental Council and other

environmental groups have been in contact with the EPA for a few years. And in fact, have provided data to the agency for this very study. Their claim of public disenfranchisement in this process is unwarranted. Congress specified the six-month period between the report and the regulatory determination. EPA should not ignore this clear statutory time table at this late date.

The second issue, the claim that EPA is disregarding the agency's PBT strategy is a red herring. The example cited earlier today, mercury is irrelevant to this study of combustion waste. The issue of mercury volatilizing off of coal piles is not a waste issue, and not an issue in this report or this regulatory determination. The small fraction of mercury in CCP is neither leachable nor volatile, the EPA addressed this issue in Section 3 and Section 5 of the 1988 Report to Congress, specifically on pages 317 and 519.

That's the end of my comments and I just look forward to EPA and Chris coming out to Indiana

next week to tour some mine sites. And hopefully, the regulatory experts and the other technical experts that will be at the sites that the DNR has invited will answer more of your questions on the placement of CCPs in mines. Thanks.

THEA MC MANUS: That concludes the public hearing for today. I want to remind everybody if you have some written documentation on your oral presentations, please leave a copy up here if you haven't done so. Finally I'd like to thank you again for your thoughtful, useful comments and taking time from your busy schedules to share them with each other and with us today. Thank you.

(Whereupon, at 4:00 p.m., the hearing was concluded.)