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IN RE:

NEW JERSEY CLEAN AIR COUNCIL  
APRIL 13, 2011 PUBLIC HEARING

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TRANSCRIPT OF PROCEEDINGS  
WEDNESDAY, APRIL 13, 2011

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4 T R A N S C R I P T of the  
5 stenographic notes of the proceedings in the  
6 above-entitled matter as taken by and before  
7 RUTHANNE UNGERLEIDER, a Certified Court Reporter  
8 and Notary Public of the State of New Jersey,  
9 held at the NEW JERSEY DEPARTMENT OF  
10 ENVIRONMENTAL PROTECTION, 401 East State Street,  
11 Trenton, New Jersey, on Wednesday, April 13,  
12 2011, commencing at approximately 9:30 in the  
13 forenoon, pursuant to notice.  
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1 B E F O R E:

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3 TOBY HANNA, Chair, Clean Air Council

4 NICKY SHEATS, Chair, Hearing Sub-Committee

5 JOSEPH CONSTANCE, Vice-Chair

6 ROBERT LAUMBACH, M.D.

7 JOYCE PAUL

8 JOHN ELSTON

9 RICHARD OPIEKUN, Ph.D.

10 HOWARD GEDULDIG

11 SARA BLUHM

12 MOHAMMAD ALI, Ph.D.

13 MANUEL FUENTES-COTTO

14 KENNETH THOMAN

15 PAM MOUNT

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1                   MR. SHEATS: Let me introduce to you  
2 Commissioner Bob Martin with the New Jersey  
3 Department of Environmental Protection.

4                   Commissioner, thank you for coming.

5                   The Commissioner will make some  
6 introductory remarks and will take some questions  
7 from the Council.

8                   COMMISSIONER MARTIN: Thank you very  
9 much.

10                  Good morning.

11                  Good morning, Council, and thank you  
12 all very much again. I talked with you last year.  
13 And I'm very proud that you are back again.

14                  You are one of the environmental  
15 groups that, again, that work with the DEP on an  
16 ongoing basis. Your work in the past has been  
17 sensational. And we've taken very good counsel from  
18 you. You provided some really good insightful  
19 direction in the past.

20                  This topic is extremely timely. As  
21 you know, both myself and the governor are very  
22 committed and very focused on cumulative impact to  
23 the communities in this state. There are a lot of  
24 communities in this state that we need to focus on  
25 pretty dramatically.

1                   There has been a lot of hard work  
2 done so far. We are very focused on redirecting  
3 even further our group within DEP on environmental  
4 justice. We believe there are several issues that  
5 in the past have been raised, but not addressed.  
6 And we believe we are going to continue to start  
7 focusing in on that very directly going forward.

8                   So I thank you very much initially  
9 here for the work that you are doing. It's  
10 extremely timely, and extremely helpful, to the  
11 Department, and to the State, and to all the people  
12 of the State of New Jersey.

13                   Understanding and evaluating and  
14 reducing unequal impacts of pollution is a major  
15 challenge. And the governor and I continue to be  
16 very committed to making that happen long term.

17                   We recognize and are committed to  
18 addressing this disproportionate environmental  
19 burdens that face primarily low income and minority  
20 communities across the State. We think that is a  
21 priority that must be addressed. The governor has  
22 spoken up very clearly that this is a priority, and  
23 we will continue to address it through this  
24 administration.

25                   We focused so far in this

1 administration on several and numerous areas of air  
2 pollution right across the State, and will continue  
3 to be a key focus of this administration.

4 As you know, the 126 petition, which  
5 you filed with EPA, EPA has rendered their opinion  
6 and sided and agreed with our 126 petition for the  
7 Portland Power Plant. The Portland Power Plant,  
8 across the river from Warren County. The hearings  
9 are scheduled for later this month.

10 We think that is an incredible  
11 victory for the people of the State of New Jersey.

12 As you know, in our rough estimates  
13 that we continue to have, about a third of the air  
14 pollution in this state continues to come from  
15 sources outside the state.

16 We could address a lot of issues  
17 within this state around air pollution, and we will  
18 continue to do that, but we must address those  
19 outside the State.

20 The governor has given us very clear  
21 direction that we must fight both within the State  
22 and outside for the polluters that continue to bring  
23 pollution into this state.

24 The 126 petition is one of those  
25 first examples. We had been languishing in the

1 courts for several years on the Portland Power  
2 Plant.

3 EPA heard our case. Our air team  
4 here did a phenomenal job modeling that air  
5 pollution. And now we are going to address that  
6 very directly.

7 I plan on testifying at the EPA  
8 hearing that will be up in Warren County at the end  
9 of this month. Lead off that, and defend the  
10 State's rights to protect ourselves from emitters  
11 outside the State.

12 Also, we've joined on with other  
13 states for the three plants, Allegheny Energy, out  
14 in Western Pennsylvania. We are battling that in  
15 federal court right now again. Forcing those plants  
16 to put on emission controls, which they refused to  
17 do. And, again, we're downwind. So we continue to  
18 fight that legal battle.

19 One of the largest coal-fired power  
20 plants in the country is in Homer City,  
21 Pennsylvania. We have also joined a suit there to  
22 have that plant put scrubbers on that plant.

23 I believe it is a plant of some size,  
24 of almost 1900 megawatts, which is just phenomenal  
25 in size, but the amount of pollutants that come out

1 of that plant is significant. And we will force  
2 that push in the courts to keep doing that.

3 We have adopted also, as you know,  
4 tighter rules, significantly reducing the sulfur  
5 content in home heating oil. We've led the nation  
6 on our work on that front. We are going to keep  
7 pushing to make sure those standards are in place.

8 There is still much more to be done,  
9 and especially focusing on injustices to a lot of  
10 the communities that are overburdened by air  
11 pollution.

12 As you know, the air quality in the  
13 State still does not meet current health standards.  
14 Ozone levels statewide exceeds statewide standards,  
15 or federal standards. Fine particulates, 13 of our  
16 14 counties exceed federal standards. Cancer risk  
17 from diesel-powered vehicles and engines, which, as  
18 we know, affect our EJ communities significantly,  
19 statewide average is 300 per million risk. In the  
20 urban areas, we're looking at risks that are 2000 in  
21 a million risk.

22 Which is unacceptable.

23 We know that issues with children  
24 with asthma and lung-related issues need to be  
25 addressed. We believe that addressing issues,



1 especially diesel, is extremely important, besides  
2 other pollutants overall.

3                   On vehicle emissions, we recognize  
4 that minimizing emissions from existing fleets is  
5 extremely important to focus on. Inspection and  
6 maintenance is required. Vehicle and engine  
7 retrofits are necessary. And we need to reduce  
8 engine idling. Engine and vehicle idling, which we  
9 see in areas especially like the Port of Newark and  
10 Elizabeth needs to be addressed.

11                   We need to accelerate the turnover of  
12 newer and advance technology fleets. So we need to  
13 make sure those vehicles that are on road, and those  
14 that are off road, start to be turned over in the  
15 future. We also need to reduce the activity of  
16 vehicles, especially trucks, the number of trips,  
17 and the number of vehicle miles in this state that  
18 trucks are on the road. Especially as they are  
19 closer to a lot of the urban areas.

20                   Some of the priority actions we have  
21 already taken is reducing idling. As of May 1,  
22 sleeper berth exemptions expire. Trucks will no  
23 longer be able to be sit overnight and idle unless  
24 they have the newer equipment.

25                   Public school vehicles and

1 particulate retrofits have occurred. For school  
2 buses, we've already completed those in the State,  
3 the diesel retrofits. Garbage trucks are almost  
4 done in the State. Other buses across the State are  
5 just getting started.

6 Publically owned vehicles and  
7 equipment, begins this year. They are working on  
8 those that are off-road vehicles. We expect those  
9 to be completed by 2015.

10 We're working on executive order  
11 right now for the first initial pilot of diesel  
12 retrofit for off-road vehicles. We're hoping to get  
13 that signed in the next couple of weeks.

14 That will be a pilot project with the  
15 DOT for the first set of equipment that is off road  
16 that are tied to state contracts. We expect that to  
17 be the model for the future. With the ultimate goal  
18 in the future of getting all off-road vehicles that  
19 are under state contract, for work that is done with  
20 the State, must have the proper retrofitted  
21 equipment on it or must be the newer equipment.

22 So it is a big jump for us.

23 The Port Authority has played a key  
24 role in this. We continue to work with them very  
25 closely, with my office, or our department, with the

1 governor's office, and with the Port Authority, to  
2 try to focus on the future of how we can make the  
3 programs there work.

4                   As you know, their current strategy  
5 is to ban all trucks -- pre-1994 trucks are banned  
6 this year unless they are retrofitted. All pre-2007  
7 trucks will be banned by 2017 unless they're  
8 retrofitted.

9                   We're working very closely with the  
10 Port Authority to make sure that the current bans  
11 are being enforced and they continue to collect the  
12 data and the transparency to make sure that that  
13 happens.

14                   The Port Authority has committed to  
15 work with both community and with the DEP to make  
16 sure that that happens.

17                   One last couple of things that the  
18 Port Authority, that they focused on. They focused  
19 on using electric cranes. Yard equipment, they are  
20 replacing. They're spending over \$7 million to  
21 replace yard equipment. And they are also investing  
22 \$6 million in clean fuel for ships.

23                   So they moved rapidly ahead in  
24 getting clean fuel into the ships going forward.

25                   At the DEP, our focus on the Office

1 of Environmental Justice, as you know, we named two  
2 new coordinators for the DEP -- for our department's  
3 environmental justice program, Riche Outlaw and John  
4 Gray.

5 Are you both here?

6 I see Riche there.

7 They're both here.

8 If you guys don't know them, please  
9 get to know them. They are now coordinating our  
10 program.

11 We decided it was time to revamp what  
12 we were doing, refocus that mission, and be out in  
13 the communities more so than ever. And I have asked  
14 them to be out in the communities. That that role  
15 was to be talking to the communities, not in the  
16 office here.

17 Wait, what are you doing here? You  
18 are not supposed to be here.

19 The bottom line is, we need them out  
20 in the communities working, understanding the  
21 issues, and understanding, where do we go from here,  
22 and make sure we got a strategy long term. To make  
23 it not just talk, but actions, to make things happen  
24 in those communities.

25 If you start looking at other areas

1 that we started focusing on cumulative impacts in  
2 the State, we also have been looking at air  
3 monitoring in Camden. We have several projects  
4 going on there for modeling air toxin emissions in  
5 Camden. And in Paterson, we continue to do air  
6 monitoring for years. In fact, we had additional  
7 money from EPA for additional air monitoring in  
8 Paterson, after we had a couple of anomalies occur  
9 on issues there that we followed up on.

10 We expect to have the final report  
11 from Paterson by early next year that gives us a  
12 long term read on the air emissions in that  
13 community. Which I hope will feed into whatever you  
14 are doing here with your group, the game plan you  
15 take on this.

16 As you know, we've also been focusing  
17 on dry cleaning equipment. The first program in the  
18 nation New Jersey had, replacing dry cleaning  
19 equipment, to purchase newer, more efficient  
20 equipment, that does not use PERC as a solvent.

21 That program has been extremely  
22 successful. Unfortunately, to the point where the  
23 demand far exceeds the money we have in that  
24 program. But we're looking to see what we could do  
25 in the future to expand that.

1                   We continue to focus on air toxic  
2 emitters, focusing both on facilities, looking at  
3 large emitters, and using reported emissions from  
4 various different department databases to focus on  
5 it.

6                   The last major area on this front is  
7 the cumulative impact screening method.

8                   I have directed my staff to continue  
9 developing and expanding the cumulative impact  
10 method, which includes new data and seeks additional  
11 stakeholder input.

12                  We see this as, absolutely, one of  
13 the critical models to be able to model cumulative  
14 impact in the communities. We see this tool as very  
15 effective, as a long-term tool, as we start looking  
16 at permitting in those communities for other  
17 programs.

18                  So, again, we think this is  
19 revolutionary in the model that we have right now,  
20 and, hopefully, our team will review that with you.

21                  Last area I want to discuss is the  
22 transformation of the DEP.

23                  The DEP continues to transform. If  
24 you heard me say it, my guess is you're probably  
25 tried of me saying it. I see some smiles out there.

1 But we need to continue to change how we do things  
2 at the DEP. Components of that include looking at  
3 how our air program works. Is there a better way to  
4 look at the air program? How do we focus on  
5 outcomes at the end of the day? How do we plan the  
6 planning process and the permitting process long  
7 term? How do we enforce long term? Is there a  
8 better way to do it?

9 I'm very much about having the  
10 science. I'm very much about having the outcomes of  
11 what we are focusing on. Last thing I want to see  
12 is more process. I want to see less process, less  
13 paper. I want to focus on outcomes at the end of  
14 the day. And I want to be able to measure it long  
15 term.

16 Our decisions are going to be based  
17 upon a lot of input besides the science, data,  
18 facts, and cost benefit analysis where necessary.  
19 We're also going to take input from stakeholders.  
20 We need input. I know you are going to hear a lot  
21 of experts today. Which I think is fabulous. I  
22 have seen the list.

23 I think that's extremely important,  
24 to have the experts.

25 I also think it's extremely

1 important, we have the stakeholders of the State  
2 actively involved in this. The people of the  
3 community, community representatives, and other  
4 organizations, businesses, all those who play a key  
5 role on this, should have an opportunity to provide  
6 us input on the direction in going forward.

7               As you know, we've also put together  
8 a science advisory board. That science advisory  
9 board is playing a key role in addressing numerous  
10 topics within the DEP. We expect to have them take  
11 and look at everything from different toxic issues,  
12 on air, water, and where we need the science.

13               As you know, that team is made up of  
14 some of the best and the brightest scientists in the  
15 State on the science advisory board. We plan to  
16 give them numerous topics over time to deal with  
17 air-related issues.

18               We're focusing, also, on a ten-year  
19 air reduction plan.

20               As you know, the recommendations you  
21 have made in the past, have been extremely  
22 important. The report you provided in the past had  
23 focused on clean trucks, which the Port Authority  
24 has worked on. Truck idling, you guys made  
25 recommendations back in 2004 on that. And launching



1 anti-idling campaigns across the board. There are  
2 over 10,000 anti-idling signs. And we're out there,  
3 both putting up signs, and distributing the  
4 information to focus on anti-idling in several  
5 places.

6                   Again, input from all of you in the  
7 past.

8                   In conclusion, I want to say a couple  
9 of things. One is, I want to thank, first, all of  
10 you for the work you have done in the past. I  
11 appreciate the time and the effort that it takes  
12 from all of you in what you are doing on making sure  
13 we get to some good answers, some good  
14 recommendations, and I am hoping what you come out  
15 with is, again, another list of actionable items  
16 that the DEP can take in the future, that we can  
17 turn from policy to real actions, to get things  
18 done.

19                   So I thank you for your work there.

20                   I thank the group here, both people  
21 from my department, who have done a fabulous job  
22 with the air program in the past, cumulative impact  
23 in the communities, you guys have done great  
24 research on there, and all the others in the  
25 community itself, and the stakeholders that are in

1 the room today, I thank you for your input. We need  
2 your input. Please help us shape the future on  
3 where we are going to go with air in this state.  
4 And I thank you all very much.

5 Thank you.

6 I am glad to grab a few questions  
7 from the Council, if you guys have any questions.  
8 If you don't, that's fine too.

9 MR. SHEATS: Commissioner, I have a  
10 question.

11 Thank you for coming.

12 I don't want to sandbag you with a  
13 tough question, but I'm sure you're used to  
14 answering tough questions.

15 COMMISSIONER MARTIN: Oh, yeah.

16 MR. SHEATS: Can you envision  
17 cumulative impacts, the concept of cumulative  
18 impacts, being incorporated into the permitting  
19 process for DEP in such a way that it will affect  
20 the decision on whether a new permit will be issued  
21 or not issued?

22 COMMISSIONER MARTIN: Yes.

23 MR. SHEATS: You had no problems  
24 answering.

25 COMMISSIONER MARTIN: No, I mean --

1 the answer is yes.

2 I can see that we need to have the  
3 right model that works, and that is why we are going  
4 further with the model, the computer model we have  
5 right now. Our team has done a phenomenal job with  
6 that. So I see us moving down that path. And I  
7 think we have to evaluate -- there has to be other  
8 factors evaluated, and including the community, that  
9 it's in there, and the multiple variables that come  
10 with it. And we realize that certain communities  
11 across the State have been overburdened with  
12 pollutants. And we have to address it.

13 You look at the statistics on kids  
14 with asthma-related issues, and breathing issues, in  
15 cities like Newark, we can't stand back and just  
16 watch. We have to bring in other factors. And we  
17 have to make sure we are looking at the picture as a  
18 whole going forward.

19 What shape it takes, and how it looks  
20 right now, I don't know that answer, but that is the  
21 direction I would like this to go.

22 Thank you all very much. I  
23 appreciate the work that you do.

24 MR. SHEATS: I want to thank the  
25 Commissioner for his remarks.

1                   And so we will start -- we'll lead  
2 off with the substantive part of our program now.

3                   First up, Professor Rachel  
4 Morello-Frosch, from UC Berkeley.

5                   And as I said before, Rachel is  
6 certainly considered one of the leading experts on  
7 cumulative impacts in the country. Arguably, the  
8 leading expert.

9                   Thank you, Rachel, for your time.

10                  PROFESSOR MORELLO-FROSCH: Okay.  
11 Good morning, everybody.

12                  So I am going to start us off today  
13 both talking a little bit about the science behind  
14 cumulative impacts. Why are we having this  
15 discussion and what is the scientific evidence  
16 behind it? And, then, what we have been doing in  
17 California to sort of leverage that science to  
18 develop a tool that can advance decision making  
19 relating to cumulative impacts. And then talk a  
20 little bit about what the implications have been for  
21 community engagement and action, particularly in the  
22 State of California, but implications more broadly.

23                  So just to be clear, I think that we  
24 need to acknowledge the role of environmental health  
25 and environmental justice advocates in encouraging

1 both the regulatory community and scientists like  
2 myself to do a better job in terms of really  
3 thinking about cumulative impacts and making sure  
4 that the science reflects the realities of the  
5 multiple environmental hazards that communities face  
6 in their different environments, where they live,  
7 work and play. And coupled with that is the need to  
8 consider social vulnerability factors that can  
9 enhance individual community susceptibility to the  
10 toxic effects of pollutant associated adverse health  
11 effects.

12                   So those vulnerability factors range  
13 from poverty, malnutrition, underlying chronic  
14 health problems.

15                   The list is quite extensive.

16                   So a picture says a thousand words.

17                   This is what we are talking about  
18 when we are thinking about cumulative impacts. This  
19 is the 710 in LA. It goes to the port. Thousands  
20 of trucks go back and forth all the time. And,  
21 obviously, the communities that are nearby are not  
22 happy about the health impacts of that. And there  
23 is a huge fight now because there is proposals to  
24 widen it. This freeway.

25                   Again, this is other examples of

1 cumulative impacts. These are kind of the pictures  
2 behind the statistics that many of us have been  
3 working on over the last several decades to address  
4 EJ questions. Both to inform regulatory decision  
5 making and to improve the community health and  
6 reduce exposures.

7                   And this is a community that I have  
8 been doing a lot of household exposure studies on.  
9 This is a community called Liberty National Village,  
10 which is very close to major transportation  
11 corridors, as well as the largest refining operation  
12 west of the Mississippi.

13                   So these are the kinds of things we  
14 are talking about when we are talking about  
15 cumulative impacts.

16                   So what does the science tell us  
17 right now about cumulative impacts? What is the  
18 state of the evidence?

19                   We have a lot of publications on this  
20 and so forth, some manuscripts on this, which I'll  
21 be happy to share with anyone who wants to E-mail  
22 me.

23                   But the first assertion is that there  
24 are disparities and exposures in environmental  
25 hazards. And that has been the focus of a lot of EJ

1 research. And that they are significant and they're  
2 linked to adverse health risks. And they're linked  
3 to social inequality.

4                   So this is a map of the United States  
5 looking at the major Metropolitan areas of the  
6 United States and looking at multi group  
7 segregation. The separation of racial and ethnic  
8 groups from each other in our major metro areas.

9                   And as you can see, the red areas are  
10 the places where we have the most intense  
11 segregation. Which the northeast, the midwest, and  
12 parts of the south are kind of the epicenters of  
13 higher segregation in this country right now. But  
14 there are also places in the west that are slightly  
15 segregated.

16                   So what does this mean for air  
17 pollution and health?

18                   So this is a study that we did a  
19 little while ago looking at racial residential  
20 segregation and what it means for disparities in  
21 estimated lifetime cancer risks associated with air  
22 toxics in these metro areas that I just showed you  
23 on that map. So this X axis here looks at metro  
24 areas with very lower segregation. And then these  
25 are metro areas with extremely high levels of

1 segregation. Each one of these lines represents a  
2 racial or ethnic group.

3                   There are two take-home messages from  
4 this chart. First, racial disparities in air  
5 pollution burdens are much greater in areas that are  
6 hyper segregated. That's not surprising. With the  
7 burden falling most heavily on communities of color,  
8 compared to the white counterparts.

9                   But the other take-home message which  
10 I think is important for policy and politics  
11 addressing cumulative impacts, is that air quality  
12 overall, for everyone, worsens in areas with higher  
13 levels of social inequality.

14                   So this really gets to the need that  
15 cumulative impacts and the inequality that sort of  
16 drives it is something that we need to address to  
17 improve environmental equality overall, and that  
18 places with higher levels of social inequality have  
19 worse environmental quality, and that communities of  
20 color are bearing the highest burden of that.

21                   And the other assertion is that these  
22 disparities are not just related to income, that  
23 there are racial disparities that persist across  
24 income categories. And I am not going to show you  
25 charts on that due to time limitations.



1                   The other assertion that I think is  
2 important to think about is that social inequality  
3 can amplify the health effects of environmental  
4 hazards. And this can play out in the individual  
5 level, as well as community level.

6                   So what do I mean by individual  
7 vulnerability?

8                   This is a study that we did looking  
9 at the relationship between exposure to different  
10 kinds of PM, PM10, PM2.5, and source PM, and its  
11 effect on average birth rate among women giving  
12 birth in California over the course of ten years.  
13 And what we see here overall is that each one of  
14 these colors represents a racial or ethnic group in  
15 terms of reporting maternal race. And we can see  
16 overall that there is a decrease in average birth  
17 rate with increasing exposure to PM. But we see  
18 that the effect is most pronounce in terms of  
19 lowering birth rate among African-American mothers,  
20 compared to their other counterparts.

21                   So everyone is adversely affected,  
22 but the effect is most dramatic among black mothers.

23                   And we see, there was a similar study  
24 that was done in the east coast, in the northeast,  
25 in Massachusetts and Connecticut, and you can see,

1 they just compared the birth weight effects among  
2 black mothers among white mothers, and the PM effect  
3 on birth weight among black mothers was much more  
4 dramatic.

5                   We also can see affects of place on  
6 health. This is a study that was done in Los  
7 Angeles looking at traffic density and the risk of  
8 pre-term delivery.

9                   And what this shows is that they  
10 didn't really see an association between increased  
11 traffic density and risk of pre-term birth among  
12 mothers that were living in high socio-economic  
13 status neighborhoods, but they did see an effect  
14 among women who were living in low socio-economic  
15 status neighborhoods.

16                   So it's not just about your  
17 individual level income or your individual race.  
18 Your health could be very much influenced by your  
19 neighborhood environment as well.

20                   The last thing is that it's constant  
21 exposures to poverty and things that go along with  
22 it, malnutrition, having trouble putting food on the  
23 table, these kinds of things, have been shown to  
24 erode the body's resilience against the ability to  
25 deal with the toxic effects of environmental hazard

1 exposures.

2                   This was an interesting study that  
3 was done in Massachusetts that looked at the risk of  
4 incident asthma in little kids associated with  
5 traffic density. And what the study found, it was  
6 published in Environmental Health Prospectus a few  
7 years ago, is that they asked kids about whether or  
8 not they had witnessed violence. Not whether the  
9 kids had actually personally experienced violence,  
10 these were not kids that were abused themselves, but  
11 in terms of their neighborhood, had they witnessed  
12 violence, fights, shootings, these kinds of things.

13                   And what they found was that the  
14 traffic incident asthma relationship was not  
15 significant among kids who were not witnessing very  
16 much violence, but among the kids that lived in  
17 neighborhoods where they were witnessing a lot of  
18 violence you saw a much stronger and significant  
19 relationship in terms of the relationship between  
20 traffic density and the risk of asthma, or incident  
21 of asthma.

22                   So, again, neighborhood quality  
23 matters. Those social factors about neighborhoods  
24 definitely can affect modification, where you see  
25 stronger health effects from pollution, compared to

1 people who live in higher SCS neighborhoods.

2                   So the implications are that the  
3 science really is indicating that cumulative impacts  
4 is real. That it plays out at the individual and  
5 community level. And so the question really has  
6 been, at least in California, among agencies, how do  
7 we translate what we know now about cumulative  
8 impacts in terms of the epi and the animal evidence  
9 into tools for decision making, even as the science  
10 begins to evolve? And, yet, right now the science  
11 is really playing catch up to community wisdom on  
12 the issue of cumulative impacts. So what do we do  
13 about it?

14                   So we were funded by the California  
15 Air Resources Board to really think about how we  
16 might translate the science into tools for action  
17 and were asked to develop what we call an  
18 environmental justice screening method. And the  
19 idea was to develop indicators of cumulative impacts  
20 that was left, research on air pollution, and also  
21 one of the metrics that were relevant and  
22 transparent to policy makers and communities.  
23 Diverse stakeholders.

24                   And the idea was also to apply the  
25 screening method to multiple uses, not only

1 regulation and permitting decisions, in terms of the  
2 Air Resources Board mandate, but also to inform  
3 local land use planning decisions at regional  
4 levels. Because we all know that transportation  
5 development, industrial development decisions,  
6 zoning, these kinds of things, also influence the  
7 distributions of people and pollution.

8                   And lastly, this tool was also aimed  
9 to be used to target areas that would require  
10 additional community outreach.

11                   So the things I'm going to show you  
12 today are three categories of cumulative impact that  
13 we use in our method. The first category is looking  
14 at neighborhood proximity to hazards and sensitive  
15 land uses. So really highlighting where you might  
16 have incompatible land uses. The second category  
17 are metrics that get at health risks and exposure  
18 from air pollutants. And the last one are metrics  
19 related to social and health vulnerability.

20                   We are currently in the process of  
21 adding a fourth category, which is getting a climate  
22 change vulnerability. This is due in part to air  
23 mandate to implement California's global warming  
24 solution act. They are very interested in adding  
25 this additional metrics. So we are working on that.

1                   So we use land use data to develop  
2 this tool. And we are very fortunate in California  
3 that we have very good land use data that tells us  
4 where people live, what land use is industrial  
5 transportation, and what is open space.

6                   So the white areas are the places  
7 that we are focusing our screening on. This is  
8 where people are, this is where schools are, daycare  
9 centers, this is where people hang out.

10                  So very often a lot of early work  
11 was, you identify the hazard, you draw a buffer  
12 around that, and then you see what is going on  
13 there.

14                  What we are saying is, let's figure  
15 out where people are, draw a buffer around polygons  
16 and the neighborhoods, and see what is in the  
17 neighborhoods themselves.

18                  So we are taking a slightly different  
19 approach here.

20                  So just to give you an example.

21                  Here is land use polygons given to us  
22 by the Southern California association of  
23 governments. As you can see, there are a bunch of  
24 different land uses here. And here is a cemetery.  
25 So we are probably not going to do a lot of

1 screening there because those people are already  
2 dead. So we spent a lot of time cutting out areas  
3 that we don't want to highlight because that is not  
4 where people are hanging out.

5                   And we take the land use polygons and  
6 intersect them with census tract blocks. And then  
7 we highlight these what we call our cumulative  
8 impact polygons that are associated with specific  
9 locks and the land uses, and then we, essentially,  
10 are giving each one of these polygons a cumulative  
11 impact score.

12                   So this is vacated. This is to sort  
13 of give you an overview of our process.

14                   So the first category is looking at  
15 proximity to hazards and sensitive land uses. And  
16 we are focusing on publicly available databases. We  
17 want this to be accessible. We want this tool to be  
18 something that is easily updatable. So this was all  
19 data that is available to us from agencies in  
20 California.

21                   So this is the kind of information  
22 that we had. And these are the kinds of sensitive  
23 land uses that we are focusing on.

24                   And the polygons receive a score of  
25 one if they contain at least one sensitive land use.

1                   And then we look at hazardous land  
2 uses.

3                   Again, all of this information is  
4 from publically available databases from the  
5 different agencies in California.

6                   So we are looking at area emitters,  
7 we are looking at hazardous waste processing  
8 facilities, and then we are looking for potentially  
9 hazardous land uses, like rails, ports, and large  
10 industrial facilities, like refineries, chemical  
11 facilities.

12                  And we count the number of sites  
13 within different buffers of the polygon edge to  
14 derive a score for each polygon. And we use a  
15 distance weighted approach, which I don't have the  
16 time to go into here, but I have a slide here, and  
17 I'm happy to make it available to anyone.

18                  This is the map that is derived for  
19 the Southern California area for the category of  
20 hazard proximity and sensitive land use. And we  
21 derive this at the census track level in part  
22 because a lot of the air quality data is really only  
23 available at the track level.

24                  And so you can see that, you know, a  
25 lot of the hazardous land use, which is also



1 influenced by traffic corridors, is concentrated  
2 along 710 and different parts where kind of the  
3 usual suspects where you would expect where there  
4 has been a lot of environmental justice organizing,  
5 but the beauty of this map, it also highlights  
6 places like Panoma. And I know you are not familiar  
7 with LA. But the beauty of this approach is that it  
8 also highlights communities that we may not be  
9 organizing. That we may not know about. That may  
10 have pretty significant issues. And that is the  
11 point too. We want to find out about those  
12 communities that maybe don't have high organizing  
13 capacity to speak out and get on the radar screen.

14           The second category is health risk  
15 and exposure. And these are the data sets that we  
16 use. We use the risk screening environmental  
17 indicators database from U.S. EPA. We use the  
18 National Air Toxics Assessment. We are currently  
19 updating to '05, which is just recently released.  
20 And we estimate respiratory hazard and we are also  
21 estimating cancer risks. We are using toxicity  
22 factors from both California's Office of  
23 Environmental Hazardous Assessment and U.S. EPA's  
24 Environmental Database.

25           And then we are also fortunate enough

1 to get information from ARB that looked at --  
2 interpolated PM 2.5 concentrations and ozone  
3 concentrations over the course of four years to the  
4 census tract level. So they made this data  
5 available to us.

6 So this is the kind of map that you  
7 get. You can see that it differs from the previous  
8 map because we are looking at a different metric and  
9 category.

10 Again, you are looking at these layer  
11 by layer to see how these maps play out. So this is  
12 what the layer looks like. And you can see the  
13 pattern is slightly different, but there is a lot of  
14 overlap.

15 And the last category is social  
16 health vulnerability.

17 These are the metrics that we are  
18 using.

19 We had an academic peer review  
20 committee that reviewed our work as we went along.  
21 We had folks from NCHS and UCLA as our peer  
22 reviewers. And we also did extensive peer review  
23 from environmental health advocates as we were  
24 developing this. And we settled on this final list  
25 because it was decided that we needed metrics from

1 SES that are commonly used in the  
2 socio-epidemiological literature and in the EJ  
3 literature. We wanted some neighborhood metrics  
4 that might get at biological vulnerability. So  
5 looking at health outcomes. And one metrics, at  
6 least, of underlying health conditions. So we used  
7 birth outcomes. We had very good birth outcome data  
8 in California. Which gets at the proportion of  
9 pre-term or small for gestational age infants. We  
10 are looking to integrate also asthma prevalence data  
11 if possible. It is a little bit of a challenge to  
12 get that at the track level, but we are working on  
13 that.

14                   And then we added two metrics that we  
15 thought were important to look at civic engagement  
16 capacity of communities. What is the capacity of  
17 these communities to engage in the regulatory  
18 process, to get themselves on the regulatory radar  
19 screen about the issues of cumulative impact?

20                   So we used data looking at the  
21 linguistic isolation of households and voter turn  
22 out.

23                   This is what the social and health  
24 vulnerability map ends up looking like.

25                   So we bring it all together. So we

1 peel the layers. I showed you the layers. And now  
2 we bring all these scores together. And the  
3 cumulative impact scores, again, each map looked at  
4 all the scores for each of these categories. We had  
5 a span from one to five.

6                   You could score differently. If you  
7 want to use deciles, you can use deciles tiles. We  
8 made our method nimble enough to allow for  
9 flexibility. Here we are using quintiles.

10                   The maximum score for a particular  
11 track is 15, and the lowest score is three.

12                   So this is what the cumulative impact  
13 scores look like, from a span of three to 15. And  
14 as you can see, the interesting thing is that we  
15 have a fairly normal distribution of the scores.  
16 And we have done some sensitivity analysis in terms  
17 of different scores and the like. The map is pretty  
18 robust and doesn't change significantly in terms of  
19 what we are highlighting.

20                   This is zooming into the South LA  
21 area, which has been a big epicenter of  
22 environmental justice concern, and it is where the  
23 710 corridor is and where a lot of the goods move  
24 from both Long Beach and LA ports.

25                   So there are some caveats to this.

1                   Our method has been developed with  
2 specific reference to air quality. We were  
3 initially funded by the Air Resources Board. So  
4 they want to know about air. But we are also  
5 funding in some new metrics. For the hazardous land  
6 use we are folding in a metric of traffic density.  
7 And we're expanding this to areas in the California  
8 Central Valley, which is our bread basket there. So  
9 we are looking at pesticide use. We're also looking  
10 at drinking water quality. That is a big issue in  
11 that region. And then as I mentioned, we're adding  
12 another category for climate vulnerability. Because  
13 agencies are interested in this due to their mandate  
14 to implement California's global warming solution  
15 act.

16                   This method performs best when you  
17 have land use data with high spacial resolution. We  
18 are now applying it to places in California that do  
19 not have great land use data. And those maps are  
20 being produced. And I think we're actually pretty  
21 successfully at dealing with this issue and we will  
22 probably be publishing those results in the fall.

23                   Again, I just want to be clear, that  
24 this is screening. This is not risk assessment.  
25 This is not predicting health effects. So

1 neighborhood monitoring is really needed.

2 We applied this and then worked a lot  
3 with those neighborhoods that are turning red in our  
4 maps to actually walk those neighborhoods to find  
5 out what we are missing. What we are capturing.  
6 What might be wrong.

7 So I think it is key, also, community  
8 knowledge about additional sensitive land uses for  
9 hazards that are not captured by regulatory  
10 databases are important to take into consideration.

11 Here is an example of ground tramping  
12 that we have done in a community in Southern  
13 California. These are hazardous land uses that have  
14 been captured through ground tramping that were not  
15 captured by the databases that we were applying.

16 So adding ground tramping is  
17 important to this when you are highlighting areas  
18 for concern of regulatory action.

19 So I think that this kind of strategy  
20 can do a lot towards identifying communities that  
21 are exposed and socially vulnerable. And you can  
22 use it in terms of policy and regulatory change.

23 California is also considering this  
24 as a way of thinking how to target resources. Our  
25 climate change law is going to be generating

1 revenue. So the idea is that a portion of that  
2 revenue should be re-vested in highly impacted  
3 communities. So this type of method can be used to  
4 help identify what communities might be appropriate  
5 for these kinds of investments.

6                   The other thing is, you really want  
7 to have a transparent approach. So, yes, our  
8 scoring method may seem somewhat pedestrian, but you  
9 want to have something that is transparent that  
10 people can understand.

11                   The reality is, the results in terms  
12 of the mapping, especially your mapping and regional  
13 level, really don't change that much, depending on  
14 your approach.

15                   And you want something that is open  
16 to modification. You want to allow some flexibility  
17 to change scoring weights, depending on your  
18 decision making context. And you want to be able to  
19 allow for updating data and adding new data later,  
20 as appropriate.

21                   I think the other issue is that, as  
22 we have developed this, and I think the key to its  
23 success has been, we have been doing an interacted  
24 and engaged process throughout its development. We  
25 had academic peer review from the beginning. We had

1 community and peer review from environmental health,  
2 environmental justice advocates, as we have  
3 developed it, and we had significant agency review  
4 across agencies. So that everyone sort of has  
5 gotten under the hood, kicked the tires, and gets a  
6 sense of how this thing was developed. We didn't  
7 just go and develop it and then screen it and get a  
8 lot of questions. We spent a lot of time doing  
9 informational meetings, getting feedback on that.  
10 There is a lot of trust now in how this thing is  
11 working from a diverse array of stakeholders,  
12 including some industry stakeholders, giving us some  
13 input.

14                   So ultimately the goal of these kinds  
15 of screening methods is to make the science better,  
16 and make good science, informed regulatory decision  
17 making. Move us away from chemical by chemical and  
18 source by source regulation. And ultimately move  
19 towards precautionary approaches to get at exposure  
20 reduction. Even when the effect mechanisms may not  
21 be there.

22                   Thank you.

23                   MR. SHEATS: Thank you, Rachel.

24                   DR. LAUMBACH: Rachel, that was very  
25 impressive. It is a very useful tool. And the



1 process of developing it is really impressive.

2                   You did mention how it is being used  
3 for outreach and targeting resources, and then you  
4 also mentioned the policy and regulatory change.

5                   What are specific examples for  
6 California this tool has been used or planning  
7 process used for permitting?

8                   PROFESSOR MORELLO-FROSCH: There is a  
9 couple of examples. One is that the Office of  
10 Environmental Health Hazard Assessment is looking  
11 at -- they have cumulative impact precautionary  
12 approaches initiative. They came out with a report  
13 at the end of last year, talking about different  
14 methodological approaches towards it. And they  
15 highlighted our method as one potential way to do  
16 it. And they are really trying to get their boards  
17 and program to begin to think about how they would  
18 incorporate cumulative impacts in their decision  
19 making.

20                   There hasn't been yet like a concrete  
21 instance where this screening has influenced policy.

22                   The air resources board is taking  
23 what we developed for them and trying to decide what  
24 metrics they want to focus on. Because agencies are  
25 going to have different priorities in choosing which

1 metrics they want to use. So we have been giving  
2 them some ideas about which ones they might want to  
3 focus on. We have been comparing our results with  
4 theirs. Ultimately, they are going to have to apply  
5 some kind of screening approach in the  
6 implementation of the Climate Change Act because  
7 there is very specific language that implementation  
8 of carbon reductions is going to have to make sure  
9 that policy and regulatory action to reduce  
10 greenhouse gas emissions doesn't create hot spots.  
11 They are charged with implementing either a fee  
12 structure and/or a cap and trade system. There is  
13 some concern that cap and trade could create hot  
14 spots. So they are struggling with how to do  
15 screening to ensure that any kind market-based  
16 approach can do that. And the screening can help  
17 them do that.

18                   And the third example is, in the City  
19 of LA, the planning commission is probably going to  
20 be applying some form of this screening method to  
21 inform its land use and zoning decision making. And  
22 it looks like they are going to be using it to  
23 combine -- do a combination of carrots and sticks to  
24 get businesses to provide them the support they need  
25 to do the right thing to clean up emissions. And

1 then, also, to inform zoning and land use decision  
2 making in areas that are already highly impacted.

3 So it's called like a clean up green  
4 up campaign for these highly impacted areas.

5 So there has been -- there is sort of  
6 movement in terms of translating the method towards,  
7 actually, application to inform decision making.  
8 It's just starting, though.

9 DR. LAUMBACH: Thank you.

10 DR. ALI: Just one question about the  
11 index -- the cumulative impact index, five to 15 is  
12 the highest score, to the lowest score.

13 What sort of health impact do you  
14 find in terms of asthma or any other health  
15 conditions, heart attacks, when your score is close  
16 to 15 or so?

17 PROFESSOR MORELLO-FROSCH: Well, so,  
18 again, this is not looking -- this is to look at  
19 cumulative -- screening for cumulative impacts.  
20 This is not an epidemiological tool to look at any  
21 association between the score and health in these  
22 tracts.

23 We have used a lot of the air  
24 pollution data to look at birth outcomes, and we see  
25 very robust relationships in areas that are more

1 highly polluted.

2                   We are looking to add asthma  
3 information into our tool not as a -- not as an  
4 outcome, but as an indicator of underlying chronic  
5 health conditions of the communities. Because we  
6 know that communities that already suffer  
7 disproportionately from underlying health  
8 conditions, whether it's cardiovascular disease,  
9 asthma, high incidence of poor birth outcomes, are  
10 also likely to be vulnerable to air pollution  
11 exposures.

12                   So we are not using it as an outcome  
13 to predict the score, but, rather, as another metric  
14 of underlying health vulnerability.

15                   A VOICE: That was a very good  
16 presentation. Very thought provoking.

17                   I was wondering whether the results  
18 that you presented here have gone through a public  
19 hearing process, particularly in the areas of the  
20 vulnerability polygons, particularly in the most  
21 hazardous areas.

22                   If so, has there been a response by  
23 the individuals, or by the community as a whole to  
24 what you have presented here? And this can be both  
25 positive and negative. Perhaps a real estate

1 company might criticize you for doing this; whereas,  
2 a public health service would be very supportive of  
3 what you have done.

4 I wondered if you could maybe hone in  
5 on some of the feedback that you got on this.

6 PROFESSOR MORELLO-FROSCH: Yes.

7 We have actually subjected ourselves  
8 to a fair amount of public review and public forums.  
9 We did a pretty extensive Webinar, statewide  
10 Webinar, at the air resources board to present these  
11 results. People either E-mailed or called in  
12 questions.

13 It was a very large hearing room,  
14 like this.

15 Actually, the reaction has been  
16 pretty thoughtful because what we have tried to  
17 emphasize with this tool is, this is not just to  
18 identify places that are bad. It's to identify what  
19 we like to call environmental justice opportunity  
20 zones. Because this is also going to help inform  
21 where potentially investments can go towards moving  
22 us, for example, toward a low carbon economy,  
23 towards investments in places that have been  
24 disproportionately impacted by large industries that  
25 are either still there and are probably on their way

1 out or they're neighborhoods where they have been  
2 subjected to a lot of industry that are now gone.  
3 So they are brown fields.

4                   So the idea is not just to say these  
5 are places that we need to kind of not have no  
6 businesses and the like. These are places where we  
7 need to be thoughtful about how we target  
8 investments and what kind of investments we are  
9 trying to encourage in these neighborhoods.

10                   So it is not a yes, no, permit, don't  
11 permit, kind of situation. But it is also being  
12 used by the Metropolitan commission towards thinking  
13 about where they want to do infill development.  
14 This will help them decide population growth, where  
15 they want to have transportation hubs, and these  
16 kinds of things.

17                   So it is really a process to kind of  
18 both think about how to target investments, but also  
19 how to think about permitting.

20                   So we haven't had a lot of push back  
21 of, oh, you can't identify us as a red community.  
22 It's more, this is helpful to us because it is  
23 showing things that we already know, but it is also  
24 highlighting the areas that we may not have realized  
25 actually have pretty significant issues.

1                   A VOICE: I wasn't clear on -- I  
2 believe you mentioned that there was funding from  
3 climate change? Revenues were available and were  
4 being used in this process?

5                   How are they being used?

6                   PROFESSOR MORELLO-FROSCH: California  
7 global warming solution act has pretty ambitious  
8 greenhouse gas reduction goals. And they are going  
9 to achieve it through dealing with mobile emissions,  
10 but also stationary emissions.

11                  So now what the air resource board is  
12 grappling with is what kind of mechanisms, what is  
13 the mix of mechanisms they are going to use to get  
14 large greenhouse gas industries, for example, power  
15 plants, cement kilts, refineries, whatever, to  
16 achieve these goal?

17                  And so the idea is to do a mix of  
18 either fees and/or cap and trade to allow some  
19 flexibility in how industry achieves those goals.

20                  So now industry is going to have to  
21 pay, to some extent, for greenhouse gas emissions.  
22 That is going to be phased in. How much they are  
23 going to pay and whether or not these allowances are  
24 going to be optional or not is still being debated.

25                  But to some extent there is going to

1 be revenue generated from the implementation of  
2 these greenhouse emissions regulations.

3 The question is, what is going to  
4 happen to those revenues?

5 And the idea is that a certain  
6 proportion of those revenues should be re-invested  
7 in communities that are disproportionately impacted  
8 by a lot of these polluting sources, many of which  
9 emit high levels of greenhouse gases as well.

10 So it could be used to encourage  
11 further mitigations and entice industries and help  
12 them defray the costs. It can also be used as  
13 investments to stimulate green jobs production and  
14 these kinds of things.

15 So that is kind of what's being  
16 debated.

17 So this kind of mapping tool can help  
18 identify what communities might be right for that  
19 kind of investment and those kind of funding  
20 strategies to encourage further mitigation by the  
21 industries that are there.

22 MR. SHEATS: Can I just ask you one  
23 last question, then we'll have to move on.

24 In discussions I had with people  
25 before within DEP, not necessarily DEP staff, but



1 with other people, I heard cumulative impacts  
2 described as junk science, not robust, you are  
3 advocating a lot of things, so it is not as robust  
4 as, say, risk assessment.

5 Could you respond to that?

6 PROFESSOR MORELLO-FROSCH: Well, risk  
7 assessment is a useful tool, but it's biggest  
8 limitation is that it relies very heavily on -- and  
9 I do a lot of risk assessments. I am an  
10 environmental health scientist by trade. So I live,  
11 breath and -- do a lot of risk assessment.

12 The problem with risk assessment is  
13 that it is very limited by available toxicology  
14 data. And so, if you don't have the data, it is  
15 very hard to do the analysis comprehensively to look  
16 at all the kinds of pollutants and hazards that  
17 people are exposed to.

18 So it's because of this heavy  
19 reliance on quantitative toxicological data and the  
20 reality of those data limitations, risk assessment  
21 leaves us in a situation where we are focusing on  
22 looking for the keys under the lamp post situation.

23 And we are also -- I am going to be  
24 tending to move towards a no data, no problem  
25 situation.

1                   Cumulative impacts assessment says,  
2 okay, we don't have toxicological data for  
3 everything, but we can assess exposures and do at  
4 least preliminary screening based on the data that  
5 we have, to at least look at the distribution of  
6 impacts, whether we're talking about exposures, and  
7 where we can do some risk assessment.

8                   So, as you saw, there was a category  
9 where we did do some risk assessment when we could.  
10 We folded that in. But we didn't leave out the  
11 other metrics that everybody really knows are  
12 important, including incompatible land uses,  
13 exposures to pollutants that we know are not good  
14 for health, like PM 2.5 and ozone. And the social  
15 vulnerability metrics, which are not conducive to  
16 risk assessment. We don't do tox data in terms of  
17 looking at social vulnerability metrics.

18                   It allows you to sort of look at  
19 these things in combination and also peel off the  
20 layers. It also allows you to decide which metrics  
21 are most important. Maybe all the social  
22 vulnerability metrics are not what you would look at  
23 all the time. Maybe not all the air pollution  
24 metrics is not what you would look at all the time.

25                   So it allows you the flexibility. It

1 is screening. It is not risk assessment. And it  
2 allows you to take a more holistic approach to what  
3 communities are facing.

4 MR. SHEATS: Thank you, Rachel.

5 Thank you very much. Spectacular  
6 presentation.

7 And we have next up from the  
8 University of Michigan, Professor Paul Mohai.

9 You heard me say that Paul has done  
10 some similar studies on correlating race and income  
11 to citing environmental hazards. He redid one of  
12 the most famous studies recently, as you will see in  
13 his presentation today.

14 PROFESSOR MOHAI: Thank you, Nicky.

15 Since Rachel has sort of tested this  
16 device for me, I will be looking in her direction if  
17 I have problems.

18 The presentation I am going to make  
19 is pertaining to a study that we have done in  
20 Michigan where we looked at pollution burdens around  
21 public schools in Michigan. And we used a number of  
22 databases. Many of whom that Professor  
23 Morello-Frosch has used herself, with her colleague,  
24 including the National Air Toxics Assessment. And  
25 we've also used data pertaining to industrial

1 emissions coming from the toxic release inventory,  
2 which many of you, maybe all of you, are familiar  
3 with.

4                   What we did in our particular study  
5 was to take the air pollution data from these  
6 various data sets and then assess the pollution  
7 loads around all the public schools in Michigan.

8                   And this first map that you see here,  
9 is a map that shows the location of all the 3,660  
10 public schools in Michigan. We used geographic  
11 information systems to identify the locations, but  
12 we also employed a team of graduate research  
13 assistants to use aerial maps to make sure that we  
14 got the locations of the schools as accurate as  
15 possible.

16                   So we went to great lengths to make  
17 sure that the locations of these schools are as  
18 accurate as they could be.

19                   One of the data sets that we used to  
20 assess the pollution burdens around the schools was  
21 from the database that Professor Morello-Frosch had  
22 mentioned, risk screening environmental indicators  
23 geographic microdata.

24                   Essentially, these are pollution  
25 burden estimates that are generated by the EPA using

1 the emissions data that's reported by the industries  
2 for the annual toxic release inventory.

3 The EPA tracks attracts over 600  
4 chemicals that are being emitted from these  
5 industries, and for most of these chemicals, they've  
6 developed relative toxicity rates.

7 Just to give you an idea about the  
8 idea behind the relative toxicity weight, a pound of  
9 one chemical could be as toxic as a thousand or  
10 10,000 pounds of some other chemical. And the  
11 toxicity weights are intended to take into account  
12 those relative toxicities.

13 And what EPA has done is they have  
14 summed the weighted quantities of these chemicals to  
15 come up with these -- to come up with a total air  
16 toxic concentration from all industrial sources for  
17 every square kilometer in the U.S.

18 And what you see in this particular  
19 map is, the one kilometer squares in the State of  
20 Michigan, which there are several hundred thousand,  
21 and they have been sorted into deciles, from the  
22 least polluted, to the most polluted, areas of the  
23 state in terms of these industrial sources.

24 What we also did was, we took the top  
25 most polluted decile and we divided it into deciles

1 again, to see where the hot spots are in Michigan.  
2 And that is what you see here.

3                   So, again, this represents the  
4 concentration of pollution from industrial sources  
5 based on sorting the one kilometer squares into  
6 these deciles, from least polluted, to most  
7 polluted.

8                   Now, not only can, with this  
9 particular database, can we look at the total air  
10 pollution burden from industrial sources on each one  
11 of these kilometer squares, but we can also separate  
12 out individual chemicals.

13                   And what our research team did was,  
14 we looked at the dispersion of manganese in the  
15 State. And that is what the manganese map looks  
16 like.

17                   Here are the hot spots for manganese.

18                   Here is another map showing the  
19 dispersion of -- we also did lead.

20                   Here is the map showing the  
21 dispersion of lead in the State of Michigan.

22                   Here are the hot spots.

23                   And we have done maps like these for  
24 at least a dozen chemicals, which I will talk about  
25 also in a minute.

1                   What we did for each of the schools  
2 is that we drew circles of one, two and three  
3 kilometer radii. And what we did was, we used  
4 geographic information systems to aggregate the  
5 pollution burden estimates within each of the  
6 squares that are captured by those circles.

7                   Now, this particular diagram shows  
8 all the circles that are intersected by a radius of  
9 two kilometers. Which is a little over a mile.

10                  One of the reasons we did this was  
11 because oftentimes the schools are on the  
12 boundaries, and our assumption here is that the  
13 adjacent pollution in these adjacent squares could  
14 be also affecting the school. So we wanted to get  
15 an aggregate estimate for fixed distances of one,  
16 two and three kilometers.

17                  When we looked at the chemicals that  
18 made up the total air toxic concentration from  
19 industrial sources around the schools, we found that  
20 12 chemicals made up about 95 percent of that total  
21 toxic concentration score. And so we focused a lot  
22 of attention on those 12 chemicals. You can see  
23 what they are here. Diisocyanates, manganese,  
24 sulfuric acid, nickel, chlorine, chromium,  
25 trimethyl-benzene, hydrochloric acid, molybdenum

1 trioxide, lead, cobalt and glycol ethers.

2                   And in this particular table, we show  
3 all the various health effects from each of those  
4 chemicals.

5                   As you can see, most of them have  
6 respiratory effects, but also other kinds of effects  
7 are also associated with these chemicals.  
8 Developmental, cardiovascular, carcinogenic and  
9 neurological.

10                   One of the things that we did -- what  
11 we did with the pollution burden estimates around  
12 the schools was to look to see how -- look to see if  
13 there was a link between the pollution burdens  
14 around the schools and school attendance rates and  
15 student performance on standardized tests. And I'm  
16 going to show you those results in a second, but one  
17 thing I wanted to show you also was this  
18 environmental justice analysis that we did here.

19                   Those ten deciles of air pollution,  
20 going from the least polluted, to the most polluted,  
21 we looked at the number of schools and the number of  
22 students in each one of those deciles. And for the  
23 most polluted decile, we found that 48 percent of  
24 all the schools in the State are in the most  
25 polluted decile, 53 percent of all the students in



1 the State are in the most polluted decile, 44  
2 percent of all the white students in the State are  
3 in the most polluted decile, but when we look at the  
4 African-American and Hispanic students, we see that  
5 the disparities -- we start to see the disparities  
6 here because we see that over 80 percent of the  
7 African-American students and over 60 percent of the  
8 Hispanic students go to school in the most polluted  
9 ten percent of the State.

10 We looked at the percentage of  
11 students enrolled in the free lunch program, which  
12 many studies used as an indicator of social-economic  
13 status for students. And, again, almost two-thirds  
14 of those students in the State are going to schools  
15 in the most polluted decile in the State.

16 Now, as I said, one of the things  
17 that we were interested in looking at was the links  
18 between the pollution burdens and students'  
19 performance on the principal standardized test in  
20 Michigan, which is called the Michigan Environmental  
21 Assessment Program Test. The acronym is MEAP, as  
22 you see in the title.

23 And what those graphs represent are  
24 the percentage of students that fail to meet the  
25 standards broken out by grades three to eight. Each

1 line represents a different grade. For example,  
2 that is the third grade right here. And these lines  
3 up here, go from four to eight. And the top half of  
4 this figure represents the percentages of students  
5 failing to meet the English standards. And down  
6 here are the percentage of students that failed to  
7 meet the math standards.

8                   And what we found was that when we  
9 looked at the schools in the first three quintiles  
10 of pollution, we didn't see much of a relationship  
11 between the pollution and the percentage of students  
12 failing to meet the MEAP standards. But when we  
13 went to the fourth and the fifth quintiles, we began  
14 to see a fairly clear relationship here, both for  
15 English and for math.

16                   We went on to do a statistical  
17 analysis to see if what we saw in the graph were  
18 statistically significant.

19                   The answer is, yes, that they were  
20 statistically significant.

21                   The schools in the fourth quintile of  
22 pollution and the fifth quintile of pollution, the  
23 percentage of students failing to meet the MEAP  
24 standards, there is a statistically significant link  
25 with the pollution around the schools and the

1 percentage of students failing to meet the MEAP  
2 standards. And that relationship holds up even  
3 after you control for compounders that are often  
4 used in these kinds of studies. We took into  
5 account the rural, central city, even suburban  
6 location schools, we took into account attendance  
7 rates, expenditures per pupil, the size of the  
8 school, in terms of hundreds of students, the  
9 student-teacher ratio, and the percent of students  
10 enrolled in the free lunch program.

11 And even controlling for those  
12 compounders, we still found a statistically  
13 significant relationship for the pollution burden.

14 I showed you the results for English.

15 This is the results for math. And  
16 pretty much the same outcome, except that, once we  
17 controlled for the compounders, it was only the  
18 fifth quintile of pollution where there was a  
19 statistically significant relationship between the  
20 amount of pollution around the schools and the  
21 percent of students failing to meet the MEAP  
22 standards.

23 Now, this particular table shows the  
24 relationship between pollution levels and attendance  
25 rates. And we found the same thing as before, that

1 the more pollution, when you get to the fourth and  
2 fifth quintiles of pollution, we find that the  
3 attendance rates in those schools tend to go down  
4 before and after controlling for compounders.

5                   Now, one of the things that we were  
6 very curious about, and this is similar to Professor  
7 Morello-Frosch's interest, is looking at some of the  
8 scientific studies that have been published, looking  
9 at the cumulative effect of multiple pollutants at  
10 the same time.

11                   This is a recently published paper,  
12 and I believe there were copies made that could be  
13 passed around of this particular paper. I don't  
14 intend anybody to read the abstract. I just want to  
15 convince you that this paper exists and it is  
16 available.

17                   This was a paper that was published  
18 in Environmental Health Perspectives just two years  
19 ago that looked at synergistic effects of multiple  
20 air pollutants. And what is interesting to me about  
21 this particular review is that they were  
22 specifically interested in synergistic effects, not  
23 necessarily additive affects.

24                   And the difference between additive  
25 and synergistic is, additive means that if you look

1 at one chemical and you measure a certain amount of  
2 effect for a certain amount of that chemical, and  
3 you got chemical number two, you measure the amount  
4 of effect for a certain amount of that chemical, and  
5 if you find the two chemicals together, that the  
6 effect is the sum of what you would find for those  
7 two chemicals individually. The sum together.

8 That would be an additive effect.

9 A synergistic effect means that when  
10 you put the two chemicals together, the effect is  
11 even bigger than the sum of their parts. So the  
12 total is greater than the sum of their parts.

13 So this study was specifically  
14 interested in synergistic affects, and is one of the  
15 first reviews of its kind. And they found quite a  
16 few studies that demonstrated these synergistic  
17 affects.

18 This particular paper is even more  
19 recent. It was published about a year-and-a-half  
20 ago. November of 2009.

21 What I found very fascinating with  
22 this study was that they looked specifically at  
23 combinations of manganese and lead in the blood of  
24 children and then correlated those quantities with  
25 children's IQ's. And the thing that was fascinating

1 for us to see in this study was that this study  
2 showed a clear synergistic effect. That, in other  
3 words, they found that the impact on children's IQ's  
4 was much greater when you had high levels of both  
5 manganese and lead. More so than simply adding the  
6 two affects together.

7                   And so this gave us an idea, because  
8 we realized that we found that both manganese and  
9 lead are in high concentrations around the schools  
10 in our study of Michigan.

11                   So we thought, okay, this is a  
12 different kind of study now. We are not looking at  
13 blood levels. We are not measuring IQ's. What we  
14 are going to do is look at the amount of lead and  
15 manganese within two kilometers of the schools and  
16 then see how they are linked with the student  
17 performance on standardized tests.

18                   What we first did was we looked at  
19 the link between the different levels of manganese  
20 and then the students' performance on the English  
21 MEAP test. And as you can see, there is a fairly  
22 pronounced relationship here, that the more  
23 pollution around the schools, the higher the  
24 percentage of students failing to meet the English  
25 standards. The more manganese around the school,

1 the higher percentage of students failing to meet  
2 the math standards.

3                   And then we also looked at lead. And  
4 here we got a much more linear relationship that the  
5 lead we started to see affect the second quintile  
6 for both English and math. It is very consistent  
7 with what a lot of studies have shown, that there is  
8 no safe amount of lead in children's blood. That  
9 any amount of lead will begin to exhibit facts.

10                   And we were seeing this in our study  
11 as well.

12                   So what we did then was we looked at  
13 the interaction. The approach is very similar to  
14 the study that was published a year-and-a-half ago.  
15 We looked at combinations of lead and manganese  
16 estimated to be in the air around the schools. And  
17 we found the same synergistic affects, that once we  
18 get to at least medium levels of manganese and  
19 medium levels of lead, we start to see significant  
20 affects on the standardized test scores. When we  
21 get up to high levels of both, the associations are  
22 particularly strong, and they hold up even after  
23 controlling for the compounders.

24                   But these are the results for  
25 English. And we got similar results for math, as

1 you see here.

2 I guess I want to say one thing.  
3 Maybe two more things.

4 A lot of these results are going to  
5 be published in the May issue of the journal Health  
6 Affairs. So much of the details about the  
7 methodology of these results, you can find there if  
8 you look up that journal.

9 I just want to mention one other  
10 thing, and that is that we have, as Professor  
11 Morello-Frosch and her colleagues have done, we have  
12 used the National Air Toxics Assessment as well in  
13 the analysis, and, essentially, got the same kind of  
14 results.

15 Now, this is the 2005, which came out  
16 only a couple of months ago, but our research team  
17 has been eagerly awaiting for these data. EPA,  
18 every time we contacted them, said, they're going to  
19 come out next week.

20 It's almost like, it's in the mail,  
21 it's in the mail, it's in the mail. And at least a  
22 year has gone by before they finally came out with  
23 these data.

24 But they finally came out with it,  
25 and we did the same -- well, what is different about



1 this data than the other data, the other data only  
2 looks at major industrial sources. The National Air  
3 Toxics Assessment tries to look at everything, major  
4 industrial sources, minor industrial sources, mobile  
5 sources. And the other thing that they do is they  
6 take the multiple chemicals, and EPA directly  
7 estimates cancer risks, neurological risks, and  
8 respiratory risks. So they already do a lot of the  
9 work for you that we had to do ourselves by hand  
10 with the toxic release inventory emissions data.  
11 They already combine the chemicals. And they track  
12 over 180 chemicals. And they combine them in such a  
13 way to produce cancer risk scores and respiratory  
14 risk scores and neurological risk scores for every  
15 census tract in the United States.

16                   And what we did in Michigan was the  
17 same thing.

18                   This is a map focusing on respiratory  
19 risks, and we divided the State, once again, by area  
20 into quintiles for the least polluted, upper  
21 peninsula here, to the most polluted. And we also  
22 looked at the hot spots.

23                   Looking at this map, I could tell  
24 every city in the State of Michigan by that map.  
25 Here is Detroit, here is Grand Rapids, Lansing,

1 Muskegon, Kalamazoo, Battle Creek, Jackson, Saginaw.

2 So when you look at the hot spots,  
3 you can see where the organized areas are.

4 So we did the exact same analysis as  
5 we did before. I would say that the main  
6 difference, using the National Air Toxics  
7 Assessment, is that the relationships are even  
8 stronger.

9 When you do the environmental justice  
10 analysis, you can see that two-thirds of all the  
11 schools are in the top ten most polluted areas of  
12 the State.

13 And I am having trouble reading my  
14 own graph here. I don't have my glasses on.

15 I think that says 69 percent.

16 Sixty percent of the white students  
17 go to school in the top ten most polluted parts of  
18 the State. Almost all African-American students do.  
19 And three-fourths of all Hispanic students do. As  
20 well as three-fourths of all the students enrolled  
21 in the free lunch program.

22 We did the same thing as we did with  
23 toxic release inventory data. We sorted the schools  
24 into quintiles based on the amount of pollution  
25 around the schools and then looked at the percentage

1 of students that failed to meet the English and math  
2 standards. And what we saw was fairly striking  
3 relationships in both using the National Air Toxics  
4 assessment.

5 We did the same statistical analysis.  
6 Got the same results.

7 Here is English. Here is math. Here  
8 are attendance rates.

9 Pretty much the same results.

10 Again, generally, the results are  
11 stronger. I think it's because we are looking at  
12 all pollution sources.

13 And that's it.

14 Thank you.

15 MR. SHEATS: Any questions?

16 DR. ALI: That is a very interesting  
17 study.

18 How does the performance of the kids  
19 in the polluted areas in math and English are  
20 impacted by other factors, like broken families,  
21 drug abuse? Do they have some impact in all those  
22 areas?

23 THE WITNESS: You ask a very good  
24 question.

25 This is kind of the challenge in any

1 study. Have you controlled for all the possible  
2 compounders that you can?

3 Part of the limitation is just that  
4 the data aren't readily available. We had 3,660  
5 schools. In theory, you could interview every  
6 household that has children in those schools, but  
7 that would, both in terms of time and money, we  
8 would not be able to do that.

9 So what we have done is try to  
10 control for all the things that we can from the  
11 publicly-available databases that are out there.  
12 And as I've said, the compounders that we used are  
13 ones that not only make a lot of sense to us, but  
14 we're somewhat reassured because we have seen other  
15 studies, including Professor Morello-Frosch's  
16 studies controlling for many of the same things.

17 So we tried to look at the  
18 relationship between the pollution levels and  
19 student performance, just looking at that, and then  
20 recognizing that there are compounders, let's try to  
21 control for them.

22 I think the compounder of interest,  
23 or concern, that you mention, I think will often be  
24 tied into the socio-economic indicator.

25 So it is very significant, by the

1 way, but even controlling for that does not explain  
2 away the effect of pollution.

3 DR. ALI: Thank you.

4 DR. OPIEKUN: In New Jersey, it is  
5 extremely difficult to get hold of student test  
6 records.

7 Were you able to get individual  
8 level, the identified scores, or were they  
9 aggregated.

10 THE WITNESS: Yeah, that is an  
11 excellent question.

12 As a researcher, who has spent most  
13 of my life trying to get individual level data, it  
14 is almost impossible to get in studies like this.  
15 This is also true for health data.

16 And where it is available, we just  
17 can't get it.

18 Maybe I shouldn't relate to something  
19 this personal, but in one of the school districts, I  
20 won't mention which one, we were trying to get  
21 individual level school data. And I think the  
22 school administration has become so accustomed to  
23 being asked for the data, you are not met on the  
24 phone by an irritable, irritated, angry person.  
25 They are very, very friendly. They are very, very

1 polite. They will answer all your questions. They  
2 will tell you that they are going to look into it  
3 and then they'll get back with you.

4 Well, time goes by and nobody gets  
5 back with you. So you call them. You get the same,  
6 very kind, friendly, polite person, and they promise  
7 they're going to get back with you.

8 And we figured out after I don't know  
9 how many tries. My colleague, Dr. Kweon, and I, I  
10 guess were somewhat naive. We tried quite a few  
11 times. And we realized that what we were facing was  
12 a tactic for deflecting the request.

13 So I think that is probably the best  
14 example of the difficulty of trying to get  
15 individual data.

16 Now, we've had people working in some  
17 of the school districts that off the record will  
18 tell us that they have individual data, and some of  
19 those data are very, very shocking. There is one  
20 data set that we are aware of where they have blood  
21 lead analysis for all the students that were  
22 suspected of being lead poisoned. And they have  
23 actually gone as far as using geographic information  
24 systems to plot their location.

25 And when we compared -- and this was

1 all visual. You know, we don't have the data. We  
2 were giving a presentation to someone who wanted to  
3 be off the record. The patterns that we saw in the  
4 children where the biggest concentrations of lead  
5 poisoning were, matched our maps.

6 It just really surprised us very  
7 much.

8 And we were very interested in those  
9 data, but I don't think we'll ever get those kind of  
10 data.

11 Rachel, you probably know better than  
12 I do about trying to get data from the CDC and other  
13 sources. They'll give you data at the zip code  
14 level, or sometimes at the tract level, but they'll  
15 never give it out on the individual. Or at least I  
16 have not been able to do that. And I don't know  
17 anyone else who has.

18 Rachel, am I right? Has your  
19 experience been similar?

20 PROFESSOR MORELLO-FROSCH: Yeah, it  
21 is challenging. Sometimes you can strike a bargain  
22 with them, where they'll give you the identified  
23 data. So you can send them your census information,  
24 and they merge it with their data, and then they  
25 de-identify it, and you can analyze it that way.

1 DR. LAUMBACH: I was wondering if  
2 this might be an opportunity if some of the  
3 pollutant levels have changed over time, and those  
4 changes aren't correlated to changes in  
5 socio-economic status or other factors, that might  
6 be an approach to disentangling the socio-economic  
7 factors from the pollutant.

8 PROFESSOR MOHAI: Let me repeat what  
9 I think I am hearing just to make sure I understood  
10 the question.

11 Have there been longitudinal studies  
12 done to look at pollution changes and to see if the  
13 pollution changes have also resulted in --

14 DR. LAUMBACH: Yes, essentially.

15 PROFESSOR MOHAI: Very good question.

16 I suspect it might be possible to do  
17 that for very localized studies, where the  
18 researcher has collected their own data.

19 When we are using something like the  
20 National Air Toxics Assessment, unfortunately, they  
21 change their modeling approach for each run.

22 And they rerun this once every three  
23 years. With a timeline of at least six years. It  
24 is 2011. The most recent data that came out two  
25 months ago is 2005 data. And each time they up



1 date -- and this is not a bad idea -- you improve,  
2 if you know how to improve your modeling procedure,  
3 you should be doing that, but even EPA warns you not  
4 to try to use those data in a longitudinal analysis  
5 because of those modeling changes.

6                   However, having said that, I don't  
7 see why EPA could not take the basic data that they  
8 have and then rerun the data using the new modeling  
9 procedure.

10                   Now, my understanding with the toxic  
11 release inventory, they are attempting to do that.  
12 In other words, they have been collecting the  
13 pollution data since 1988 and modeling dispersions,  
14 air pollution dispersions. They, too, keep changing  
15 the models. So if you are trying to do a  
16 longitudinal analysis, you run the risk of the  
17 changes you see are more modeling changes than the  
18 real changes on the ground.

19                   But they told us that it would be  
20 possible for them to take the data that they already  
21 have on emission sources from industry, and then  
22 rerun all the previous years.

23                   If they did that, we could actually  
24 do what you are saying. But so far, we have not  
25 been able to get that data either.

1                   It's not as bad as, it's in the mail,  
2 or we'll get it to you. It's possible, but there  
3 are a lot of hurdles we have to go through.

4                   We're hoping, actually, in the coming  
5 year we'll get those data.

6                   But the National Air Toxics  
7 Assessment, I don't know. It's interesting, the  
8 EPA, there are two different offices that generate  
9 the National Air Toxics Assessment, and then the TRA  
10 Michigan modeling is done in a totally different  
11 office. Different group of people, different  
12 leadership, and so on. I know the heads of both,  
13 but have gotten different feelings about what is  
14 likely to happen in the future.

15                  MS. MOUNT: Thank you.

16                  Both your and the previous speaker  
17 was very compelling data. We really appreciate it.  
18 One of our charges is to figure out what to do with  
19 data like this. And I am wondering if Michigan has  
20 taken all these compelling results and made a leap  
21 to try to figure out how the State, the communities,  
22 can do something with it?

23                  THE WITNESS: Yes.

24                  My colleagues and I have actually  
25 made presentations to a lot of small groups in

1 Michigan and we found a lot of interest in what we  
2 have. We haven't -- at this point, we have not  
3 pushed too hard on things until we had a peer review  
4 publication. Which we are expected to have next  
5 month.

6 So that is going to help us do that.

7 But I think the more general response  
8 to that question is that data like the National Air  
9 Toxics Assessment and the toxic release inventory,  
10 those data alone would allow the EPA to do a  
11 baseline assessment. For example, the National Air  
12 Toxics Assessment estimates pollution burdens for  
13 every census tract in the U.S. Well, obviously,  
14 that could be married with the demographic coming  
15 from the census borough.

16 So we could do a baseline analysis of  
17 current conditions, and then if we make that a new  
18 policy, or make a new rule, EPA could try to predict  
19 what the changes in the environmental disparities  
20 would be as a basis of that rule.

21 It's similar to the idea for me as  
22 the environmental impact statement that was required  
23 under the national environmental policy act. The  
24 EPA, if they were going to do -- any -- if there was  
25 going to be a major action that would have a

1 significant effect on the environment, the  
2 environmental impact statement was supposed to show  
3 something like eight different alternatives, and  
4 Scenario A would do this, Scenario B would do that.

5 Well, they were predicting the  
6 future. And if you are making a prediction, you are  
7 not going to be a hundred percent on the money.

8 But when you go through that  
9 exercise, and then you have to make that document  
10 available to the public, and the public gets a  
11 chance to scrutinize your data and methods, I think  
12 you are going to see some improvement.

13 So I see a lot of potential in  
14 Professor Morello-Frosch's and her colleague's  
15 screening tool.

16 One thing that was going through my  
17 mind, well, with the data that you have, you are  
18 taking a baseline assessment of current conditions.

19 California wants to pass a new law  
20 that will affect the environment. Alright. What  
21 will the rankings of 315, how will they change as a  
22 result of implementing that rule?

23 I think it can be done.

24 I'll be honest with you, over the  
25 years, I am personally frustrated by the fact that

1 one of the defenses I hear often made is that "we  
2 don't have the data."

3 Well, if that is the case, let's sit  
4 down and figure out what data we need, and let's go  
5 out and collect it. We can do it. It is not an  
6 impossible thing to do. We could do that. There  
7 are some good databases, like the National Air  
8 Toxics Assessment. And we could do better. We  
9 don't have a lot of good data on water and other  
10 kinds of hazardous substances, but we have some, and  
11 we could try to get more.

12 MR. SHEATS: Thanks very much.

13 So next up, we have some of our  
14 homegrown talent. Robert Laumbach, from EOHSI. And  
15 Rob I think is going to talk about an interesting  
16 study he is going to be doing with the Ironbound  
17 Community Corporation. And he has worked a lot with  
18 communities in New Jersey.

19 DR. LAUMBACH: Thank you very much.

20 I am going to talk about a very  
21 different approach than what we heard from the first  
22 two speakers about how to assess specifically  
23 non-chemical stressors and their interaction with  
24 chemical stressors, using the example of asthma, and  
25 looking at in the community level, and an individual

1 level, at the Ironbound community here in New  
2 Jersey, where we are trying to understand how  
3 non-chemical stressors can interact with, in this  
4 case, diesel exhaust and other traffic-related air  
5 pollutants to make asthma worse.

6                   So we're looking at how biologically  
7 stress can act through common pathways with chemical  
8 stressors to make things worse.

9                   As Dr. Morello-Frosch pointed out,  
10 there are many ways that socio-economic status can  
11 be associated with poor health outcomes, like  
12 increased asthma, poor access to care, poor  
13 nutrition, poor general health. But one way, and  
14 sort of highlighted by the example that  
15 Dr. Morello-Frosch gave of the clarity study, which  
16 showed that exposure to violence was associated to  
17 having a response to traffic-related air pollution.  
18 There was a higher incidence of asthma in that case.  
19 In the case that stress may be one of those factors.  
20 And stress we do know has a biological activity in  
21 the body, which can influence health.

22                   So we know that stress can influence  
23 health. And we also know that air pollution  
24 influences health. And our study here, in  
25 collaboration with the Ironbound Community

1 Corporation and the Ironbound neighborhood in  
2 Newark, is a sign to try to answer how that could  
3 happen.

4                   So this is an example of an academic  
5 community partnership that we have to try to answer  
6 this question about how psychosocial stress can make  
7 air pollution on asthma worse. This was a study  
8 that we designed sort of from grass roots, from the  
9 bottom up, with the Ironbound Community Corporation,  
10 with Ana Baptista as one of the co-PI's on the  
11 project, in response to an EPR to try to get more  
12 information about how non-chemical stressors can  
13 interact with chemical stressors to cause health  
14 effects. Because there is an emerging epidemiology  
15 indicating that, but it's really, at this point, not  
16 that clear how that occurs. So we designed this  
17 four-year project in the Ironbound to look  
18 specifically at individuals with asthma, and how  
19 stress and traffic-related air pollutants and diesel  
20 exhaust, in particular, affects their health.

21                   I'm sure Ana is going to speak later  
22 this afternoon and give more details about the  
23 neighborhood in the Ironbound, but it is about  
24 50,000 people who live in an, approximately, four  
25 square mile area. That is bordered by -- we heard

1 earlier about the concerns about ports -- the Port  
2 of Newark Elizabeth. The largest port on the east  
3 coast. Adjacent to the neighborhood. New Jersey  
4 Turnpike. Heavy diesel truck traffic. Route 1&9.  
5 And then throughout the neighborhood trucks pass and  
6 they also park and idle on streets, again, adjacent  
7 to the port and industrial areas.

8                   Here is a school here that we are  
9 focusing on, which is near Route 1&9, and near these  
10 two major -- within the community arteries, Raymond  
11 Boulevard and Ferry Street, which have a lot of  
12 truck traffic passing through.

13                   And then, of course, there is also  
14 Newark Airport, with another source of air pollution  
15 in the area.

16                   Asthma is a recognized problem in the  
17 community. I think it was pointed out earlier,  
18 there is community wisdom about air pollution and  
19 asthma that science is catching up with. And,  
20 certainly, there is a lot of demonstration now in  
21 studies that air pollution does affect asthma. And  
22 then in the community, you will see trucks  
23 everywhere in the neighborhood.

24                   And then it is also recognized, I  
25 think generally, that chronic stress, and stress of



1 many different types, can affect asthma. And there  
2 too, I think there is scientific data supporting  
3 that.

4 But there is still an open question  
5 as to whether or not, especially in this  
6 neighborhood, whether cumulative impacts of chronic  
7 stress and air pollution, particularly diesel  
8 exhaust, are affecting asthma in the community.

9 It is not known how high the rates  
10 are of asthma in the Ironbound, but it is known in  
11 Newark, in general, that the rates seem to be about  
12 four times within Newark, the hospitalization rate  
13 at least, compared to the surrounding communities in  
14 Essex County.

15 The community has taken some action  
16 by doing some truck counts. In front of that  
17 Hawkins Street School, a couple years ago a truck  
18 count counted 144 diesel vehicles passing by in one  
19 hour around the time the kids go to school. They  
20 walk to school in this neighborhood.

21 There is a variety of different types  
22 of trucks that go to and from the port. There are  
23 also local trucks as well.

24 And then some data has been collected  
25 about the impact of that, in terms of exposure to

1 air pollution. This is data from an eight  
2 kilometer, which measured black carbon. Which is a  
3 pretty good specific indicator of diesel exhaust  
4 exposure. In front of the Hayes Park Pool, which  
5 was on that prior map. Also near the school in that  
6 neighborhood, in east Ironbound. Showing that there  
7 is a piece of exposure, this is compared to a  
8 background neighborhood, without the trucks, a piece  
9 of exposure that are attributable to the trucks.

10               So there is an issue about overall  
11 exposure, but then also about the impact of these  
12 peaks, which occur in very specific times and  
13 places, potentially near where kids are who have  
14 asthma.

15               There are many different types of  
16 stressors. I think we are all familiar with acute  
17 stress, which cause a fight or flight response. And  
18 all though kids in the Ironbound are not going to be  
19 exposed, I don't think, to charging lions, there are  
20 other stressors that may occur in the Ironbound and  
21 elsewhere.

22               And, you know, it's interesting,  
23 stress has been known to affect asthma clinically,  
24 and I think people who have asthma, I know people,  
25 even families who have asthma, recognize that stress

1 can affect asthma. But in controlled exposure  
2 studies, where people are exposed to acute  
3 stressors, it's sort of mixed. There's some  
4 evidence that stress could actually be protective.

5                   When you think about it, really, it  
6 should be physiologically, biologically, because the  
7 fight or flight response should activate us, open  
8 our airways, get us ready to fight or flight. And  
9 the stress hormones that are produced in the acute  
10 stress response are cortisol, which is an  
11 antiinflammatory, the major agent used in treating  
12 asthma, and epinephrine, which is adrenaline, which  
13 is also a Beta II agonist, technical term for the  
14 kind of medication that we use to open the airways  
15 when people have asthma attacks.

16                   And then shortness of breath itself  
17 should be a powerful acute stressor. And so it  
18 makes sense that an acute stress response should  
19 sort of combat or protect against an asthma attack.

20                   So there are acute stressors, and  
21 then there is also chronic stress. So we are either  
22 repeated acute stressors over time or life events  
23 that lead to long lasting stress.

24                   There is some developing evidence  
25 that suggests that chronic stress over time down

1 regulates the acute stress response. And it's been  
2 shown in studies of people who have post-traumatic  
3 stress disorder, or people who are caregivers, or  
4 people who are chronically ill, and other people who  
5 have chronic stress, that they have reduced cortisol  
6 levels, and also reduced levels of receptors for  
7 cortisol. So they may be more vulnerable to  
8 situations where they need an acute stress response,  
9 such as an asthma attack.

10                   And this makes sense in an  
11 evolutionary sense because we mobilize a lot of  
12 resources, our heart starts to beat faster, our  
13 blood sugar actually goes up, and we are exposed to  
14 an acute stressor. And so it makes sense that that  
15 would be down regulated if we are repeatedly having  
16 sort of false alarms.

17                   So we think that -- well, actually,  
18 we are pretty sure then that traffic air pollution  
19 can affect via increasing pulmonary inflammation and  
20 also directly probably through irritant mechanisms  
21 decrease pulmonary function, and that leads to  
22 people having asthma exacerbation or worsened  
23 asthma.

24                   And then our hypothesis is that  
25 chronic stress sort of acts by decreasing these

1 protective mechanisms. So by reducing the amount of  
2 cortisol that is released in an asthma attack,  
3 reducing the amount of adrenaline, and other  
4 substances in the body that combat an asthma attack,  
5 that that makes asthma attacks worse. People who  
6 are chronically stressed.

7                   So what we are going to do in the  
8 Ironbound is we are going to recruit 40 kids, age  
9 nine to 14, who have asthma, and really intensively  
10 monitor their daily asthma status and measure their  
11 personal exposure to black carbon, using small  
12 personal monitors that can give a realtime, you  
13 know, minute by minute, black carbon measurement,  
14 and then small badges that measure their nitrous  
15 oxide, another marker of traffic-related air  
16 pollution exposure. And do this for up to 30 days  
17 with each kid. So it is really intensive. It is at  
18 the individual level.

19                   So the first question communities are  
20 interested in is whether or not the exposure to the  
21 diesel exhaust and other traffic pollutants makes  
22 asthma worse in that neighborhood?

23                   The next question is, does chronic  
24 stress make the affects of the traffic air  
25 pollutants even worse?

1                   And to assess that we are going to do  
2 a six-month period -- excuse me, a chronic stress  
3 interview, a standardized interview, with the  
4 children, that is going to measure their stress  
5 levels over the previous six months. So major  
6 stressors, episodic stressors, chronic stressors.

7                   Then we are going to actually measure  
8 their acute stress response.

9                   So the ideal thing to do would be,  
10 from a scientific point of view, to induce an asthma  
11 attack and see how they respond to that in terms of  
12 stress.

13                   Obviously, we can't do that.

14                   But we can do a short-term stressor,  
15 an experimental stressor, which has been  
16 standardized in children, where they do a small  
17 public speaking task, and that elicits an acute  
18 stress response, and we can measure that, and see  
19 how that also affects -- well, that is a marker,  
20 sort of, whether people are going to have better --  
21 or, actually, worse outcomes from exposures to  
22 traffic air pollution.

23                   So the implication of this hypothesis  
24 are that because this affects a pathway by which  
25 many stressors could influence asthma, is that it

1 is, actually, simplifying the problem of having many  
2 different stressors that may affect asthma and  
3 interactions with other outcomes and other types of  
4 exposures as well. Other types of socio-economic  
5 stress may all act through this type of pathway,  
6 potentially, in terms of stress response. It may be  
7 one of the ways they they'll act through. And then  
8 it may be not just relevant to the asthma triggers  
9 that we are looking at, traps, but, perhaps, other  
10 asthma triggers as well. It may be one way of  
11 simplifying this multiple stressor, multiple outcome  
12 problem.

13                   So in conclusion, you know, the  
14 studies, the community, academic partnership, can  
15 seek answers to focused questions that we're  
16 interested in scientifically, but that the community  
17 is also interested in, and we're further interested  
18 in the community trying to do something about the  
19 trucks, particularly trucks from the Port of  
20 Elizabeth and Newark that go through the  
21 neighborhood.

22                   And then ultimately -- you know, it's  
23 a four-year project. So I just don't want to it  
24 talk about how much data we have today and how we  
25 understand it. It takes time to collect the data,

1 but, ultimately, it may help to improve and actually  
2 make possible cumulative risk assessments that  
3 include non-chemical stressors, as well as chemical  
4 stressors. Or at least help to advance that.

5 Thank you.

6 MR. HANNA: The Commissioner talked a  
7 little bit about the Port Authority's plans for  
8 improvements, and it sounds like some of that is  
9 taking place over the duration of your study.

10 Are you going to be able to correlate  
11 the two? How will you approach that?

12 DR. LAUMBACH: In this study, each  
13 subject, we are looking at exacerbation of asthma in  
14 kids who have asthma. They sort of act as their own  
15 control. So each subject has different levels we're  
16 expecting of diesel exhaust exposure from day to  
17 day, and then we correlate that to their asthma  
18 outcome. So as long as there's differences from day  
19 to day, our site should be able to detect that. If  
20 over time, longitudinally, some of the children are  
21 less exposed because we only can do three or four  
22 children at a time because of the expense of the  
23 equipment that we need to use, that probably won't  
24 have too much of an outcome, affect on the outcome,  
25 except in terms of, perhaps, being less sensitive in



1 the later years because there will be less variation  
2 day to day in exposure if the trucks aren't cleaned  
3 up.

4 But I think because the average life  
5 of diesel vehicles is, perhaps, 30 years or more,  
6 and several million miles, that it will take time  
7 before there are really substantial changes. And  
8 even with the Port's program, and it is not clear  
9 how successful that is going to be, as well as the  
10 fact that there are many other trucks in the  
11 neighborhood that are not from the Port as well.

12 MR. HANNA: And whether you could  
13 project improvements to your results, you'd probably  
14 have to repeat that years out, I guess, to really  
15 measure that, right?

16 THE WITNESS: Right.

17 This study isn't so much designed for  
18 that. It is only 40 kids. And it's really to get  
19 at the mode of action, biological mode of action, by  
20 which stress may interact with diesel exhaust.  
21 Whereas, other studies, larger studies,  
22 population-based studies, would be more appropriate  
23 probably for looking at changes over time.

24 MR. SHEATS: Thank you very much.

25 Next up, we have Professor Tina Fan,

1 also from EOHSI. The Environmental and Occupational  
2 Health Science Institute. Tina has also done a lot  
3 of work with communities, especially down in Camden.  
4 She continues that work. And also does some work up  
5 in Newark. And, particularly, of course, for the  
6 Clean Air Council.

7 PROFESSOR FAN: Thank you for your  
8 introduction.

9 I am glad to be here.

10 Today I am going to present an  
11 approach that we generally use for the community  
12 exposure to air toxics. So as you heard from the  
13 previous speakers, it is a challenge to assess a  
14 community's health risk associated exposure to air  
15 pollution.

16 So it is challenging to assess a  
17 community's exposure to air toxics because one of  
18 the reason is, it's very challenging because many  
19 air toxics have multiple sources, including both  
20 like, for example, on road or off-road source.  
21 Also, some industrial source.

22 Also, it is a given, the communities  
23 which have many source of those air pollutants,  
24 there is a large -- there could be a large spacial  
25 variation. So, therefore, it is also from the

1 general like one central monitor site may not really  
2 capture those local air pollution levels, which some  
3 people also call those hot spot of air pollution.

4                   So, therefore, the community exposure  
5 to air toxics could be underestimated based on those  
6 long-term data.

7                   So another thing we like to also  
8 characterize is, we understand as a personal  
9 exposure also associated with personal behavior and  
10 activities. One of the things we realize, based on  
11 the literature review, many of the activity data,  
12 activity data we collected previously, are from the  
13 telephone interview.

14                   So for some of the local community  
15 members who are particularly the one that is  
16 socio-economic disadvantage groups, they don't have  
17 phone service, or they often move like more to  
18 different places, so they are not really necessarily  
19 being reached by those survey. So, therefore, there  
20 is lack of data for the activity for those EJ  
21 groups.

22                   So today I am going to use one of the  
23 studies we conducted in Camden, which is a joint  
24 effort from U.M.D.N.J. EOHSI with the New Jersey  
25 DEP. We did a study in Camden New Jersey, which is

1 one of the neighborhoods called the Village of  
2 Waterfront South.

3 This particular neighborhood, as you  
4 see, is very small. If you look at the -- this is  
5 waterfront south. So this is a small neighborhood.  
6 It is about a half by 1.5-mile square.

7 If you look at the black dots, there  
8 are a lot of industry located right actually in the  
9 neighborhood.

10 Actually, previously I was told about  
11 53 and later some have moved or closed up. There  
12 are still about 26 of them located in that area.

13 So the source of air pollution in  
14 this neighborhood is really a mixed source of air  
15 pollution, including a lot of small sources. And  
16 there are also high risk, like 67, going around  
17 here. And there is a major -- one of the major ways  
18 that people actually need to go to 676, to  
19 Philadelphia, they have to pass through there, the  
20 community to get there.

21 There are also -- another concern is  
22 this neighborhood is also downwind of Philadelphia.  
23 So it could be transport of air pollution from like  
24 what we call urban air pollution, from Philly to the  
25 neighborhood.

1                   So here is some pictures. Many of  
2 you, particularly the local people, are very  
3 familiar with Camden. So there are some pictures we  
4 took over there previously.

5                   As you see, there is a lot of like  
6 metal processing industries, and there are a lot of  
7 junkyards, car scraping facilities. And, also, you  
8 see, this is a highway built like right pretty much  
9 on the top of those public housing.

10                  When we started the study at that  
11 time, they were like still building the public  
12 housing right on the highway. And this is a sewage  
13 plant, Camden sewage plant, located right in the  
14 backyard of the elementary school.

15                  There is data compiled by the New  
16 Jersey DEP. You could see there are all different  
17 type of facilities. Some of the data that the  
18 company said was emitting, including many of the air  
19 toxics, as well as other particulate matter.

20                  Here is the demographic information.  
21 As you see, waterfront south, many people live under  
22 the poverty levels. And, also, many of them are  
23 minority groups. And when you compare to either New  
24 Jersey State, as well as nationwide.

25                  And there are a couple of data I

1 would like to mention here. This is the community  
2 next to waterfront south. So we selected that  
3 neighborhood for our control. What we call urban  
4 reference site. They are about 2-miles away from  
5 waterfront south, but they have similar demographic  
6 information.

7                   The objective of the study is to,  
8 basically, we try to determine the local ambient air  
9 pollution level, as well as the personal exposure of  
10 the waterfront south residency. And, also, we try  
11 to assess the impact of those industry facilities,  
12 the emission from the industry facility, personal  
13 exposure, and, also, we try to identify what are the  
14 particular sources of the concern.

15                   And another objective, we try to  
16 characterize a time and location pattern of those  
17 particular groups and see whether they are the same  
18 or different from the general population.

19                   So the study's design is simple. We,  
20 basically, recruit about a hundred subject from the  
21 neighborhood. 60 from waterfront south and 40 from  
22 CDS. And we monitor them during the two seasons,  
23 summer, winter, and also weekdays, weekends.

24                   So all participant were monitored  
25 like four times.

1                   During the monitor time we also  
2 collected questionnaire data.

3                   Here is just like a typical time  
4 activity sheet we gave to the subject. So they will  
5 fill in the information about, how much time they  
6 spend outdoor, how much time they spend indoor.  
7 Also, indoor/outdoor, will also differentiate  
8 whether the indoor in local area or is it indoor  
9 like in other area.

10                  And here is some monitoring site. We  
11 did the sampling site. As you see, this is a  
12 personal sampling. Has some personal monitors. You  
13 can kind of capture the air toxics which are more  
14 close to the personal information group. And we  
15 also have local state monitoring in that  
16 neighborhood. And this is Sacred Heart Church. We  
17 got great support from the local community. So they  
18 provide the space for us to place a monitor in the  
19 community.

20                  And this is New Jersey DEP's  
21 monitoring site at Copewood/Davis.

22                  And besides those monitoring, we also  
23 did another campaign to look at spacial variation of  
24 the air toxics in the two communities. So as you  
25 see, these are very intensive sampling. That is

1 what we call saturation sampling.

2 One of the reason is because there  
3 are so many different small point source in the  
4 area. So we want to see whether there is any  
5 difference from this street block to the next  
6 streets.

7 And, also, these are personal  
8 monitoring we used for this saturation sampling.

9 And here is just some data I would  
10 like to show you.

11 For example, this is ambient  
12 particle concentration in the fixed location. The  
13 red represent the waterfront south and green is for  
14 Copewood/Davis. In general, for PM 2.5, we did find  
15 a significant higher level from south than  
16 Copewood/Davis. However, actually, the personal  
17 data, actually they are similar. Because one of the  
18 reason we know, there are many other indoor sources  
19 as well for PM 2.5. So, therefore, the outdoor  
20 contribute to the PM 2.5 and also the other sources  
21 contribute to the PM 2.5 on that one.

22 And this is another data about  
23 benzene.

24 For benzene concentration, actually,  
25 we did not find a difference between these two



1 locations. As you know, benzene, one of the major  
2 contributor is from automobile exhaust. And,  
3 actually, in the CDS area, although there are no  
4 identified local point source, however, there are  
5 still a lot of local roads with heavy traffic.

6 So this is a BaP. One of the ph.  
7 Which is a carcinogen. We also found a higher level  
8 in waterfront south and CDS.

9 You know, based on those monitorings,  
10 we are able to look at the association between the  
11 outdoor concentration to the personal level.

12 So we, actually, for some species,  
13 not all the species we measure, some of them we  
14 really found a very significant association between  
15 the outdoor level to personal. So that, actually,  
16 verified the significant contribution of the local  
17 air pollution source personal exposure.

18 So this is another data. We look at  
19 the time activity data. As I mentioned, the  
20 personal level really associated with your  
21 particular behavior.

22 You look at the Camden study cohort,  
23 they actually spend significant more time out doors  
24 than other general population. So their particular  
25 behavior also placed them at a greater risk to

1 exposure to local air pollution.

2 We also look at their time activity  
3 by like gender or also subject type.

4 The red bar represent -- that is a  
5 U.S. general population, their behavior, and the bar  
6 is what we found in our study.

7 We found, generally, like men, like  
8 outdoor more than women. And also regarding age  
9 wise, older people, generally, they stay in house  
10 more, and the children play outside more.

11 So it is like a typical behavior like  
12 you will see, the kids are more active.

13 That is also another indicator of  
14 potential risk for small children.

15 I would like to talk a little bit  
16 more about the spacial saturation sampling we did.

17 As I showed you earlier, we did not  
18 find benzene difference between the two locations  
19 from the fixed monitoring site. From the spacial  
20 variation, since then we did not find significant  
21 difference between the two locations.

22 However, for some particular  
23 pollutants, for example, toluene, we actually found  
24 really the hot spot. There are some sites with a  
25 much greater level than the rest of the sites.

1                   So we did a proximity analysis.  
2 Looked at the distance from each location to the  
3 mountains or spacial saturation sites. So,  
4 actually, we were able to identify what are the  
5 potential sources that contribute to the spacial  
6 saturation.

7                   These are the names of the facilities  
8 that we found. Most of them are some of the metal  
9 processing facilities.

10                  This is in waterfront south.

11                  When you look at the CDS, you see  
12 only the roads, local roads, were found as a  
13 significant contributor to those spacial saturation.  
14 So only one facility to waterfront south was also  
15 found contributing to the CDS air pollution.

16                  So, anyway, our study in general,  
17 really proved that the approach about spacial  
18 variation sampling, also monitoring in the community  
19 scale, the air monitoring is a really powerful tool  
20 to identify the potential area of hot spot of air  
21 pollution. Also, the population at risk. And,  
22 also, we need to pay attention to this particular  
23 subgroup about their behavior. So which we could  
24 probably through, like community outreach, to guide  
25 them during higher air pollution days, you really

1 should probably stay inside more than being outside.

2 I would like to thank all the  
3 investigators from EOHSI and the collaborators from  
4 DEP, as well as many of our staff and students from  
5 EOHSI, as well as the funding agency from Health  
6 Effects Institute.

7 Thank you.

8 MR. SHEATS: Anybody have a question  
9 for Professor Fan?

10 DR. LAUMBACH: Very nice  
11 presentation. Thank you.

12 I am wondering, did you look at the  
13 extent to which meteorologic conditions might affect  
14 levels of air toxins in the communities. In the  
15 sense that, I know Charlie Turnin here has some  
16 concerns about how that is not really assessed, in  
17 terms of how air toxins locally in the community may  
18 be affected by stagnation or other meteorologic  
19 conditions.

20 PROFESSOR FAN: That is a good  
21 question.

22 Actually, if you look at -- we  
23 definitely look at the meteorologic condition as the  
24 proximity analysis data.

25 Actually, on the right column, those

1 are one speed and one direction.

2 So when we did the proximity  
3 analysis, all those factors were included in them.

4 DR. LAUMBACH: Did you find that  
5 overall like at community levels, that levels were  
6 higher, I would assume so, when say wind speed was  
7 lower?

8 THE WITNESS: Yes, wind speed is  
9 definitely one of the major factors that affect the  
10 air pollution level. Yes, we also found that.

11 MR. SHEATS: Thank you very much.

12 So that ends our EOSHI team. We're  
13 going to start our government team. Starting off  
14 with Steve Anderson.

15 Oh, I'm sorry. I skipped somebody.

16 Forgive me, Professor Isukapalli.

17 Let me give a special thanks because  
18 you are coming with short notice. We didn't give  
19 you much notice about the presentation. And I know  
20 you don't feel very confident right now so I missed  
21 you. But we do appreciate you coming.

22 PROFESSOR ISUKAPALLI: I am going to  
23 talk a little bit about an overview of the modeling  
24 tools, compilation and simulation type modeling  
25 tools that help support both state implementation

1 plans of the NJDEP and how these tools are  
2 applicable for more wider domains of interest. And  
3 give you how we systematically go from air pollution  
4 to multimedia pollution and community exposure.

5               So when we are looking at air  
6 quality, initially our focus was mostly on -- was on  
7 levels in New Jersey and the northeast.

8               Once we look at just air pollution  
9 itself, it is a multi pollutant problem. Multi  
10 state problem. Things happening because of multi  
11 emissions from power plant, interacting with  
12 emissions from southern states. Coming up to New  
13 Jersey and producing those in the air.

14              And this requires computer models  
15 that will follow all the basic transport processes.  
16 Collection of all the data. Simulating the  
17 chemicals of all the reactions happening.

18              Now, once we solve this problem for  
19 ozone, the same technique, the same computation for  
20 framework is applicable for studying the  
21 concentrations of PM. And as we look at the problem  
22 with more focus, we see that the same approach can  
23 be extended to other chemicals, air toxics, and so  
24 on.

25              So here is an overview of how the air

1 quality in New Jersey has been turning in the past  
2 few years. Very good improvement in overall air  
3 quality. And the same thing with some of the air  
4 toxics, formaldehyde and benzene.

5                   However, in both cases the levels are  
6 a little bit above the benchmark.

7                   And this is all despite, we are  
8 driving longer and longer distances, but still there  
9 is a reduction in overall ambient levels of those  
10 chemicals.

11                   However, people are not exposed just  
12 to ambient air, they're also exposed to multiple  
13 chemicals that are being released in doors. And  
14 some of these chemicals are interacting with ambient  
15 air to produce new products.

16                   Here is an example of studying the  
17 formation of particulate matter in the environment.  
18 Ozone.

19                   So we cannot look at the whole  
20 problem as one pollutant at a time, but, also, we  
21 need to consider the mixture impact. So that is the  
22 rationale for going for a multi pollutant framework  
23 for assessing the ambient levels for assessing the  
24 human exposure.

25                   And, also, to briefly touch on how

1 this impacts even once this pollutant enters the  
2 body.

3                   So the whole framework is, basically,  
4 a process-based framework that follows from the  
5 emissions to the health effects is a systematic  
6 sequence of steps. Contaminants are released into  
7 the environment, they are transported over large  
8 regions, they interact with other chemicals.  
9 Meanwhile, people are moving from different  
10 microenvironments. Moving from different locations.  
11 They are coming into contact with the chemicals.  
12 And this has an impact on how much gets into the  
13 body, the physiological characteristics, their  
14 activity, lifestyle attributes, impacts how much is  
15 absorbed within the body. And then some chemicals  
16 have synergistic health effects and some have  
17 antagonistic.

18                   This framework focuses on the entire  
19 sequence.

20                   Here is one example of what are the  
21 steps we use in studying the exposures to this  
22 particulate. We have estimates of the background  
23 concentration, and using the photochemical models,  
24 just like the ones we used for supporting the DEP's,  
25 we use enhanced versions of that, which can also



1 study the multiple air toxics.

2 We take that information with the  
3 information on population demographics,  
4 socio-economics, and fuse it to obtain what people  
5 are really exposed to at different microenvironments  
6 within the entire region of study.

7 We couple that with what are the  
8 particular activity patterns of individuals and  
9 obtain how much they are exposed. And we can study  
10 how much affect goes into the body.

11 So this is done in a statistical  
12 manner using a large number of what we call multiple  
13 variables that we define based on the demographics  
14 and statistical attributes of multiple physiological  
15 and socio-economic variables.

16 So that when we perform these studies  
17 for a large number of variables, as we increase the  
18 number of samples it slowly converges towards what  
19 the real population exposure would be happening.

20 Here is one example of step one of  
21 the process where we are estimating the  
22 concentrations of formaldehyde and benzene.

23 As you can see, in the case of  
24 formaldehyde, in the summertime there is a more high  
25 intensity; whereas, in the case of benzene, you have

1 higher concentrations during the winter.

2                   So when you are following an  
3 individual over a period of a year, or multiple  
4 years, you need to consider the cumulative impact of  
5 all these contaminants together.

6                   Here is one example where the  
7 monitoring information is limited to the summertime  
8 for benzene; whereas, you have higher concentrations  
9 happening during the wintertime. However, since we  
10 are using comprehensive mechanisms based on air  
11 quality monitoring, we are able to capture hour to  
12 hour for the entirety.

13                   Here is the corresponding thing for  
14 formaldehyde. You can capture activity for  
15 formaldehyde.

16                   From there we identified the  
17 corresponding population exposures. Here we are  
18 looking at the different percentages of the people  
19 that are exposed to benzene as part of -- due to  
20 just ambient contribution from ambient sources.

21                   As you can see, there is a wide  
22 variation. Two orders of magnitude within this  
23 small area, the Philadelphia Metropolitan area.

24                   And, likewise, we go one step to the  
25 corresponding exposure concentrations. It is the

1 same thing.

2                   We can look at the contributions to  
3 time spent indoors and outdoors and across different  
4 seasons. And you can see the patterns in the  
5 ambient concentrations do not necessarily need to be  
6 maintained. These patterns are impacted -- patterns  
7 of exposures are impacted not just by the  
8 concentrations, but also by the make up of the  
9 people, the housing, and so on, within the area.

10                   You can see that when you are looking  
11 at concentrations of periods of high exposure, you  
12 see some areas that have much higher exposure  
13 concentrations than these.

14                   This is the same example with  
15 formaldehyde. You see almost an inversion of the  
16 exposure.

17                   And using this system, we can study  
18 the impact of exposures either by considering the  
19 impact of those exposures alone or together, total  
20 exposures.

21                   This helps us interpret health risks  
22 in the context of corresponding health risks arising  
23 from indoor contaminants.

24                   So why do we need to look at sources  
25 that are not just ambient air quality and exposure

1 concentrations?

2                   Because once the source enters the  
3 body, they don't stop interacting with each other.  
4 In fact, for many VOC's, the metabolic of each VOC  
5 is impacted by the presence of other VOC's. There  
6 is mostly an inhibition for the same enzymes within  
7 the liver.

8                   So here is one example where if you  
9 do not -- this shows the impact considering the  
10 binary actions around the chemicals. There are more  
11 complex interactions happening because of presence  
12 of these multiple chemicals.

13                   You can see, if you are arriving at a  
14 risk estimate, you are more likely going to  
15 substantially overestimate or underestimate  
16 depending upon the presence of these interactions.

17                   However, to calculate these things  
18 you need a fairly complex physiologically  
19 pharmacologic models. And our lab has been focusing  
20 on developing some sort of a study for these  
21 approximations to these models that can be used by  
22 non-specialists for a large number without having to  
23 run complex models.

24                   Here is one example we looked at  
25 simplifying the model in order to get a quick

1 estimate of capturing more complex exposures in that  
2 area.

3                   The same model, the same base model  
4 that we used for air toxics has been expanded to  
5 characterize the impact of pollutant emissions and  
6 looking at exposures to pollutants. And, also,  
7 mapping future scenarios affecting the land use,  
8 land cover, and different meteorological patterns.  
9 How it will impact in the future.

10                   The same approach we are using.  
11 Somebody spraying pesticides from aircraft. We are  
12 looking at exposures to the general public and  
13 occupational for the cabin crew. We study the  
14 distribution of the contaminants. We follow the  
15 same principle of following as they go through  
16 different tasks. And it helps us to interpret the  
17 risks to pesticides being sprayed in the cabin  
18 environment with respect to what the general  
19 population is exposed to from other media.

20                   Here we are looking at blue lines and  
21 green lines, inhibition or thermal exposures  
22 occurring in the cabin due to one spraying incident.  
23 And the red line shows what the general public is  
24 exposed to from foot, using the pesticide.

25                   So this helps us interpret these

1 risks in the overall context of multimedia  
2 exposures.

3                   We are expanding this for not only  
4 contaminants like pesticides, but also looking at  
5 how this will be able to explain the risks and  
6 exposures of passengers to other chemicals within  
7 the environment. Ozone from the stratosphere being  
8 pulled in and reacting in the cabin and producing  
9 various VOC's.

10                   And to come back to the importance,  
11 here is one example of how minor improvements in  
12 refining our estimates of different types of  
13 emissions can help us evaluate different strategies.

14                   This shows the composition of NOX and  
15 VOC's for the entire region, which includes the  
16 southern states.

17                   If you can see on the right most  
18 side, there is a substantial difference in the  
19 levels of the benefits that we see from the  
20 simulation. Just by using a slightly improved  
21 science, model for characterizing the emissions of  
22 biogenic VOC's in the area.

23                   And this has an impact on assessing  
24 how much the benefit will be not only on the ozone,  
25 but also on the environment.

1                   So the conclusion is that by using  
2 this integrated model that follows the same  
3 principles throughout, any improvements in  
4 individual competence will directly benefit all of  
5 the pieces together.

6                   On the other hand, if you are looking  
7 at one chemical at a time, it will take a  
8 substantial amount of time to pull these benefits  
9 into other scenarios.

10                  So the conclusion is we do this  
11 integrated type modeling.

12                  The one approach that we started with  
13 air pollutants, it is now evolving into one  
14 environment approach we have. You can interpret  
15 health risks and assess different strategies or  
16 cumulative strategies in the holistic framework by  
17 following what is known as a personal direct  
18 approach.

19                  This approach is gaining more action  
20 in the environmental community.

21                  We are able to do this because a lot  
22 of synergistic projects are funded and on the  
23 computer. We can make them all fit into the same  
24 framework. Some of these efforts are also intended  
25 to supplement other field studies. We are

1 collecting a large amount of environmental data. So  
2 we use computer models to provide some background  
3 level estimates for different chemicals and  
4 exposures.

5 This is a large group. It was  
6 initially started through funding through the DEP  
7 and the research center, and FAA, FDA.

8 Thank you.

9 MR. SHEATS: Questions from the  
10 Council?

11 Just one question.

12 I notice you had microenvironment.  
13 Could you define that very quickly  
14 for us?

15 PROFESSOR ISUKAPALLI: The  
16 microenvironment is where people are spending their  
17 time.

18 So if a person moves from indoors, to  
19 outdoors, and back and forth, the microenvironment  
20 is the personal space around this individual.

21 MR. SHEATS: Thank you very much.

22 We're going to do -- am I safe in  
23 saying -- well, we want to do one more before lunch.  
24 Steve, you ready to go?

25 Am I safe in saying now we are going



1 to go to our governmental talent now?

2 And, Jerry, can you stay until after  
3 lunch?

4 DR. FAGLIANO: I could, or I could be  
5 really quick.

6 However you want to do it.

7 MR. SHEATS: You have too much to say  
8 to be really quick.

9 Steve, why don't you go.

10 Steve Anderson, New Jersey Department  
11 of Environmental Protection, to talk about a  
12 screening tool that he has been instrumental in  
13 helping to develop.

14 MR. ANDERSON: Thanks, Nicky.

15 I will be very, very quick.

16 Professor Morello-Frosch really set a  
17 good foundation for what I am going to talk about.  
18 So I think I can go through some of this stuff  
19 really quick. It was a real benefit to have her  
20 research in front of us. And we used, in  
21 discussions with her, in coming up with what I am  
22 about to go through now.

23 Just real quickly, a little bit of  
24 history background of what we have been doing, a  
25 little bit of other similar research, and where we

1 are going forward based on the Commissioner's  
2 direction to us to keep going.

3 Just real quick, the Department has  
4 been looking at cumulative impacts for a while.  
5 Started with the environmental equity rule, if  
6 Melinda is still here, that she did. Where we  
7 looked at a screening model to estimate cumulative  
8 impacts, to enhance the public participation in the  
9 permitting process, a series of executive orders.  
10 We are working very closely with the environmental  
11 justice advisory council. We first kind of started  
12 with a self identifying model, where communities  
13 could identify themselves. Then that EO kind of ran  
14 its course. The second EO, where we really started  
15 looking at screening methods, where the council did  
16 a lot of research, we did combined research with  
17 them. They presented us kind of a very detailed  
18 report. And the Department responded to them, where  
19 their basic recommendation was to try to develop  
20 some type of screening approach.

21 And what I am about to go through is,  
22 basically, our response back to the council on that.  
23 We have done a couple of things that has been done.  
24 Some presentations. Working a little bit with Ana,  
25 the Ironbound community, in cooperation with her,

1 and the EPA care program. The science advisory  
2 board, what was on their list of things to look at.

3 Real quick, Professor Morello-Frosch  
4 kind of went through this, as far as what this is  
5 and what this is not.

6 Impact is not a risk assessment.

7 It's just using civil indicators to  
8 try to figure out where multiple sources of hazards  
9 and exposures may be operating to impact a  
10 particular area.

11 It's comparing relative impacts.

12 It's really a bias for action. As  
13 science continues to develop, what can we do in the  
14 interim for some of these things to try to make some  
15 progress?

16 As we talked about, as far as  
17 categories of indicators, the same basic three.  
18 Environmental exposure categories, social and  
19 vulnerability categories, public health.

20 Right now, this method that we are  
21 focused on right now, is really on the environmental  
22 exposure indicators is really what we looked at up  
23 to this point. Where we are really kind of  
24 comparing those indicators with some of the social  
25 vulnerability indicators, race and income.

1                   So we are not adding them together  
2 like some methods do. We are comparing them.

3                   Real quickly, other similar methods.

4                   EPA, the enforcement program,  
5 developed something called EJ SEAT. Strategic  
6 enforcement assessment tool.

7                   We looked at that.

8                   Faber research, up in Northeastern,  
9 in the State of Massachusetts, has issued, actually,  
10 two reports on unequal exposure. That is a method  
11 we looked at closely. And then, of course, all the  
12 research going on in California, where Professor  
13 Morello-Frosch did mention the final report that was  
14 issued in December. We looked at that, as well as  
15 all the work that went into that as well.

16                   This is just a real quick picture of  
17 what the EPA model does, where it goes through the  
18 demographic indicators and health indicators and  
19 kind of combines them together into one basic score.  
20 And that is the basic set up of what they do.

21                   Right now we are really focused on  
22 the environmental indicators. It's actually kind of  
23 a combination of the environment.

24                   This is the indicators that the Faber  
25 research looks at, as far as different kind of

1 proximity indicators, different types of sites,  
2 cleanup sites, and yellow sites, landfills. They  
3 have given different scores and come up with kind of  
4 a facility density type indicator, or proximity.

5 We don't do kind of the scoring that  
6 they do. Actually, what we do is give more of a  
7 simple density approach.

8 And this is from the California  
9 report, where they do have several indicators as far  
10 as the socio-economic ones, race, income and  
11 poverty, the sensitive populations, the exposures,  
12 which we really kind of focused on, were very  
13 similar to this, environmental affects, and health  
14 outcome, as far as birth outcomes and so forth.

15 That Jerry will be talking about in a  
16 little bit.

17 That is kind of the stuff we looked  
18 at. This is the basic outline of what we do. Where  
19 we're at. We identify the indicators. We quantify  
20 those indicators on a very, very fine geographic  
21 scale. There are different options, as far as  
22 quantifying them and then aggregating them. Then we  
23 scale those up to do basic comparisons to race and  
24 income, is the basic path that we are on right now.

25 This is -- I could spend a lot of

1 time on this, but I won't. But these are the  
2 indicators here that we have. There has been a lot  
3 of talk about NATA. It kind of dates the research  
4 back. We are using the 1999 right now. We are  
5 waiting for the 2005 to come out. I was going to  
6 use 2002, but I figured I might as well wait until  
7 2005.

8 We are looking at the risks per  
9 million. We are looking at the diesel numbers for  
10 NATA, because diesel is not included in that  
11 calculation from EPA.

12 We developed our own estimate for  
13 benzene impacts from stationary sources at a very  
14 fine geographic scale of a hundred meter grid basis.

15 Then we have traffic indicators. We  
16 put a thousand foot buffer around all the roads, and  
17 we have traffic counts for all that traffic, as well  
18 as heavy trucks. Then we have proximity indicators,  
19 the density of major regulated sites, major air  
20 sources, large hazardous waste facilities, major  
21 surface water dischargers, and so forth.

22 Contaminated sites, we looked at  
23 those, contaminated sites here. Dry cleaners.  
24 There is a lot of those. We do have a density for  
25 that. And junkyards as well. Recycling facilities.

1 That are kind of concentrated in urban areas.

2 I mean, in general, we have kind of  
3 regional indicators, where the cancer risk is at a  
4 census tract level. It was interesting that  
5 Professor Morello-Frosch used both the EPA recode,  
6 the risk indicator, the risk data from individual  
7 facilities, as well as NATA. We're kind of caught  
8 in between that too. And that is really where the  
9 benzene indicator came from, where we recode, just  
10 have the TLI facilities. There is so many more. We  
11 built a database with our air pollution database,  
12 our underground storage tank database, and some  
13 right-to-know data, and came up with an inventory of  
14 about 9,000 facilities. We were able to do some  
15 basic modeling for that. That was our fix to the  
16 problem. To try to get that local variation with  
17 the problem with access to data.

18 So those are the basic indicators we  
19 have and how we kind of rolled them together.

20 On a geographic basis, what we have  
21 done is, if you are familiar with GIS, we are  
22 working in a raster system, not a becker system. So  
23 we have a hundred meter grid for grabbing those nine  
24 indicators. And for each one right now we are  
25 calculating a Z score of 4. To get a percentile and

1 other things. And a lot of it will come out very  
2 similar, as far as what Professor Morello-Frosch  
3 said.

4 But we're looking at that, as far as  
5 whether there should be a percentile or not. But  
6 right now we use a Z score.

7 We have two different scores for each  
8 grid. There are nine indicators, so there are nine  
9 grids stacked on top of each other, with the tenth  
10 kind of added everything together. We could either  
11 sum them all together or count the grids with a Z  
12 above one. So we have a max of 27, we have a max of  
13 a Z score of three, or a max of nine, depending on,  
14 I think, what you use. That is nuts and bolts.

15 This is just the result statewide for  
16 what it looks like. It's not really surprising.  
17 This is the count methods. So the max would be  
18 nine. You have nine indicators that are above a  
19 standard deviation of one. Northeast is right  
20 across, New York City. As well as Camden.

21 Those are the areas that show kind of  
22 a common sense from this.

23 So that is the environmental side.

24 Real quickly, we don't add the socio  
25 and demographic, but we do correlate it. So this is



1 at a block group level what the state looks like for  
2 percent minority.

3 What we have done is, we have taken  
4 the hundred meter grid data and came up with what an  
5 average impact would be to race and income.

6 And this is the kind of relationship  
7 that you would do that it shows, the X axis, that is  
8 the percent minority here, the Y, this is the count  
9 method. The top would be nine. Shows how an  
10 estimate of cumulative impact increases as percent  
11 minority on the block goes up. And percent poverty  
12 kind of shows the same relationship.

13 That is where we are at as far as  
14 work needed. The Commissioner has kind of directed  
15 us to keep going. A lot to do. First kind of  
16 updating the existing indicators that we have. The  
17 first will be an example where we talk about NATA  
18 for diesel. This is a map that we have on the air  
19 program on diesel risk in the State. Which is very  
20 high. The red areas are between a hundred and a  
21 thousand in a million risk. That is the total risk  
22 for diesel right there.

23 Just a couple others.

24 This is breaking up between non-road  
25 diesel, sort of construction equipment, so forth,

1 where it is centered in those areas.

2                   There is the on road. You can see a  
3 little bit of the transportation quarters going on.

4                   The existing indicators we have all  
5 have to be updated and those would be the important  
6 ones. And there is a lot of other indicators that  
7 we are working on. We worked very closely with the  
8 Department of Health. Jerry will be speaking in a  
9 little bit on the environmental health tracking  
10 program, developing drinking water indicators. We  
11 want to get to some of the things I just talked  
12 about as far as ambient data using the SMAC data for  
13 ozone 2.5. And also doing more on, for example,  
14 facility release data, using the recede data or  
15 expanding our benzene approach to other pollutants.  
16 As well as looking at additional vulnerability and  
17 health data. That is primarily what we are working  
18 with the Department of Health on.

19                   That was quick in between you and  
20 lunch, but I would be glad to answer a question or  
21 two.

22                   MR. SHEATS: Thanks.

23                   Steve presented to the Council,  
24 actually, a report. So we really wanted him to  
25 present to the public.

1                   Thanks very much, Steve, for coming  
2 out, once again, the second time in presenting to  
3 the Council and to the public.

4                   I think what we would like to do, we  
5 were scheduled to start at 1:15. Although could we  
6 post a sign we started 15 minutes later?

7                   How about if we start at 1:30?

8                   It seems like we're way behind, but  
9 we are not because, unfortunately, we had a speaker  
10 cancel this afternoon.

11                  So please come back at 1:30.

12                  I am looking at Willa when I say  
13 this, all speakers in the room can have lunch  
14 upstairs with the Council if they want to.

15                  We recommend to everyone else,  
16 because we know you don't want to miss a minute of  
17 the afternoon, maybe go to lunch at the cafeteria,  
18 that is only a few feet away.

19                  (Whereupon, a luncheon recess is  
20 taken.)

21                  MR. SHEATS: I think we're going to  
22 call it back to order.

23                  I hope everybody had a good lunch, a  
24 brief respite, and we're going to start back again  
25 with Dr. Jerry Fagliano, from the Department of

1 Health and Senior Services.

2 Thank you for coming.

3 Jerry doesn't necessarily know where  
4 all the dead bodies are, but he knows where all the  
5 data in New Jersey is.

6 DR. FAGLIANO: Good afternoon,  
7 everybody.

8 I am going to talk about public  
9 health data in New Jersey.

10 What I want to talk about, there are  
11 a few parts to it. First, I just want to go over  
12 quickly what are the public health data sets that  
13 are available in the State to even think about, to  
14 look at, in terms of understanding a community's  
15 vulnerabilities.

16 So I am going to describe a couple of  
17 data, public health data resources, that are  
18 available to the public that we are building in New  
19 Jersey. And, then, at the end, talk a little bit  
20 about how we might want to try to integrate some of  
21 this information into the work that Steve Anderson  
22 presented earlier in an overall model.

23 So we have data in New Jersey on  
24 public health. Some of it is difficult to get, as  
25 was alluded to earlier, or difficult to get at the

1 scale that people want to see it. But let me just  
2 go through what those basic public health data sets  
3 are. There are many more, but these are the ones  
4 that are at least relevant to the environmental  
5 public health issues.

6                   We have vital events data. So we  
7 have information on births, deaths, and infant and  
8 fetal deaths. We have specific registries for  
9 certain health outcome. Cancers, all cancers are  
10 reportable to the State health department.

11                   So we have a comprehensive database  
12 that goes back to the late 1970's to track the  
13 incidence of cancer. So this is occurrence, not  
14 deaths. This is occurrence of cancers. And, also,  
15 we have a registry of birth defects statewide that  
16 has been comprehensive since about the early 1990's.

17                   We also have administrative data that  
18 tracks hospitalization and emergency department use.

19                   This is primarily collected for the  
20 purpose of understanding billing and costs of  
21 healthcare, but associated with that data is  
22 information on each patient in terms of diagnoses.  
23 So we can actually track the patterns in  
24 hospitalization by cause throughout the State.

25                   We also have a data set that relies

1 on laboratory reports of exposure and childhood  
2 blood lead is one that is tracked statewide on all  
3 children, or all tests performed on anybody, but  
4 especially children.

5                   So those are the kinds of data sets.  
6 And what we are trying to do is make available to  
7 the public as comprehensively as we can, as many of  
8 those data sets as we can. And we are in the early  
9 stages of making this information available to the  
10 public.

11                   So what I am going to do is describe  
12 the efforts that we are doing and where we are now  
13 and where we want to head.

14                   We are one of about 25 states, and  
15 New York City, working with the Centers for Disease  
16 Control in Atlanta to put together what is called  
17 the environmental public health tracking network.  
18 In New Jersey we are working closely with our  
19 partners at DEP, who are providing on the  
20 environmental side, and working with us as well on  
21 many other aspects of the program.

22                   The resource we're using in order to  
23 display public health information is what we're  
24 calling the State Health Assessment Data System, or  
25 New Jersey SHAD, and in that system we have both

1 links to publications, but, more importantly, we  
2 have indicator reports on a variety of different  
3 sorts of measures, public health measures, as well  
4 as a custom data query system that allows the public  
5 user to ask their own questions about the data.

6                   So I am going to go through some of  
7 those features right now.

8                   So this is the entry page to our  
9 environmental public health tracking. You don't  
10 need to look at this in detail, but on the left  
11 side, just gives an indication of the kinds of  
12 content that we have in the system. We have air and  
13 drinking water quality data for New Jersey  
14 environmental quality, human exposure data in terms  
15 of lead and carbon monoxide, and a variety of health  
16 outcomes, from birth outcomes, death, to due to  
17 various outcomes, cancer, heart attack,  
18 hospitalization, asthma hospitalization, et cetera.

19                   So we try to bring all these kinds of  
20 measures together. And these pages have a lot of  
21 background information on these outcomes.

22                   We also can link, at the bottom, we  
23 can link to the New Jersey SHAD system to get actual  
24 data sets and to look at indicators.

25                   So this is the SHAD system, and as I

1 said, there are two primary ways of looking at data.  
2 You can look at it in terms of pre-written and  
3 predigested, essentially, indicators for a variety  
4 of factors, as well as the custom data query system.

5           The indicators are cross categorized.  
6 And we have it according to a variety of different  
7 sorts of interest areas. One of them is health  
8 disparity priority areas, which is a very big issue  
9 in public health to understand and to document  
10 disparities in health status across different  
11 demographic factors. And these are some of areas  
12 for which there are indicators.

13           The environmental public health  
14 tracking site, which is our component in the system,  
15 also has a variety of different categories of  
16 content for which there are numerous indicators in  
17 each one. We have about 57 indicators across these  
18 different categories at the moment.

19           Just to give you an example, this is  
20 an indicator profile. We always talk about why it  
21 is important, we also have text related to what is  
22 being done about a particular problem, and this just  
23 shows a line graph of the death rate due to heart  
24 disease in New Jersey and the U.S. Which has been  
25 improving steadily over the past few years. And I



1 will come back to this in a moment.

2                   In addition to sort of line graph  
3 presentations, we also have bar graph type  
4 presentations, which show particular outcome by, in  
5 this case, by race, ethnicity and sex, which  
6 indicates that, you know, heart disease mortality  
7 varies by race group. In this case,  
8 African-American mortality rates are higher than in  
9 the white population, which are, in turn, higher  
10 than Hispanics and Asians.

11                   We also in our indicators have some  
12 maps which show the geographic pattern. This is by  
13 county in this case. These are two indicators which  
14 kind of parallel each other, looking at the percent  
15 of births with low birth rate and children under age  
16 five years living in poverty. Which, of course,  
17 show a very similar pattern.

18                   So in addition to all these  
19 indicators, which people can access, we have an  
20 ability for people to look at and query the data,  
21 asking their own questions. So we have the birth  
22 data sets and mortality data sets currently in the  
23 system and infant and fetal mortality.

24                   So these can be queried.

25                   I just did one graph here that looked

1 at percent of infants with low birth rate by  
2 mother's education and prenatal care.

3                   So you can ask for and you can ask  
4 questions about these kind of health outcomes by a  
5 variety of different maternal and infant  
6 characteristics. In this case, obviously, showing  
7 the very strong relationship between the lack of  
8 prenatal care and the high percentage of low birth  
9 rate. And that is persistent across education  
10 level.

11                   This is a series of slides which just  
12 indicate for mortality the downward trend in all  
13 causes of death, heart disease, cancers, and  
14 cerebrovascular diseases, or stroke, over the past  
15 decade or so. Six years or seven years.

16                   What is striking is that it is going  
17 down in all ethnic groups, but there are still  
18 discrepancies between or disparities between the  
19 groups that are persistent and not being reduced  
20 very much. So the upper lines in each of those are  
21 mortality rates in African-Americans, and the middle  
22 lines are among whites, and the blue lines are among  
23 the Hispanic population.

24                   And just another query. This is just  
25 a mortality query that can be done. I just wanted

1 to illustrate based on geography. So these are five  
2 particular counties. So we have a bar graph looking  
3 at mortality rates of cancers in these five counties  
4 by race group.

5 And, again, it shows that there are,  
6 indeed, differences that we need to be aware of.

7 So you can ask questions like this  
8 from our system. It's available for you to ask  
9 whatever questions you wish.

10 So what are we planning to do to  
11 improve this system?

12 Currently, we are working on a  
13 capacity to do dynamic mapping of the query output  
14 from whatever questions you're asking. Right now  
15 you cannot generate a map, but we are working on  
16 that capacity.

17 In addition to births and deaths, we  
18 are going to be bringing in the hospitalization and  
19 emergency department data set, hopefully within the  
20 next couple of months. So that can be custom  
21 queried by the public.

22 Next, after that, we hope to bring in  
23 the childhood lead exposure database.

24 And finally, we do have a capacity  
25 for people to query cancer in another system right

1 now at the county level, but we do also want to  
2 bring that into our New Jersey SHAD system  
3 eventually.

4 We also are developing a secure  
5 portal for internal use where the data can be  
6 queried at a finer geographic scale.

7 The query system for births and  
8 deaths at the moment, you can ask questions at the  
9 municipal level. In the secure portal we are hoping  
10 to be able to build capacities to ask questions at  
11 the zip code and the census tract level as well.

12 So let me kind of shift gears a  
13 little bit and talk about how we might want to use  
14 public health measures in this kind of model that  
15 Steve was trying to develop.

16 First of all, I think public health  
17 measures are by their very nature cumulative impact  
18 measures. Unfortunately, there are cumulative  
19 impacts due to a variety of many, many factors that  
20 go beyond the environmental occupational exposures.

21 To really understand the interactions  
22 among all these different factors is the challenge  
23 of epidemiology. And I think that is a long, long  
24 battle that we have to fight, in terms of really  
25 understanding how these factors interact to produce

1 health impacts.

2                   But for our purposes, I think we can  
3 use them as is, as indicators of vulnerability to  
4 potential added environmental stressors. So it is a  
5 matter of choosing the right ones to integrate into  
6 a particular kind of model to show communities that  
7 are, perhaps, at increased risk of harm from  
8 particular stressors.

9                   So we are in the process of trying to  
10 determine which ones will be the best kinds of  
11 indicators to use for vulnerability assessment.  
12 There are a variety of different options that we  
13 have. We can look at sort of general measures of  
14 health, overall mortality, mortality due to heart  
15 disease, or cancers. We can look at infant health,  
16 infant fetal mortality, low birth weight. I think  
17 Dr. Morello-Frosch mentioned small for gestational  
18 age or prematurity. There are other measures as  
19 well that could be used.

20                   We could also look at more specific  
21 measures like childhood lead exposure,  
22 hospitalization or emergency use due to, say, heart  
23 attacks or asthma specifically.

24                   We could look at cancer incidents  
25 overall. We could look at very specific kinds of

1 cancers that may have a relatively strong component  
2 due to environmental exposures. And we can also  
3 potentially look at things like birth defects.

4 The problem with some of these  
5 outcomes is that they are rare. And so trying to  
6 develop indices that have meaning at a local level  
7 and can be integrated into sort of community level  
8 assessments is pretty challenging.

9 So that is where we are. We're still  
10 trying to figure out which measures we would be able  
11 to use in a meaningful way and how to use them with  
12 respect to the kind of indices that Steve is  
13 developing.

14 So I think I'll stop there. I just  
15 would encourage you to visit the environmental  
16 public health tracking and the New Jersey SHAD Web  
17 sites. And there is also, I would point you to a  
18 health department strategic plan to eliminate health  
19 disparity, which is also on our Web site.

20 Thank you.

21 MR. SHEATS: Questions from the  
22 Council?

23 Jerry, what do think is going to be  
24 the biggest challenge as far as continuing the work,  
25 finding the data, making it available?

1 DR. FAGLIANO: Making it available to  
2 the public, I think the biggest challenge is the  
3 issue of scale that I alluded to earlier.

4 The data sets that we have available  
5 to the public now, like I said, are available at the  
6 municipal level.

7 The fact that a lot of towns are very  
8 small, with relatively small numbers of outcomes,  
9 limits our ability, unless we do things like  
10 merging, creating different geographies that put  
11 different towns together. You know, data for  
12 certain cities could easily be -- put out an even  
13 smaller scale than the municipal level potentially.

14 In terms of integrating these kind of  
15 metrics into a set of measures that would fit into a  
16 model for vulnerability, again, I think they're  
17 similar. One of the problems that we have is to  
18 understand outcomes, we would have to take into  
19 account age. Because we weren't trying to compare  
20 across different geographies, whatever populations,  
21 the age structure of those populations has a big  
22 impact on the health outcome. So it's important for  
23 us to adjust these measures for age.

24 And we don't really have intercensal  
25 estimates by age and race for small geographies

1 below the county level. So we have to come up with  
2 those so we can adjust for age at smaller scales in  
3 these kinds of metrics.

4 MR. SHEATS: Thank you.

5 Thank you for coming today.

6 I think we're moving from -- it has  
7 been very data laden so far. Which I think has been  
8 good, but I think we are moving more toward the  
9 policy end.

10 We have next, Ray Werner, Chief of  
11 Air Branch EPA Region 2, who came on short notice.

12 MR. WERNER: I am not going to turn  
13 out the lights. I know it is right after lunch. So  
14 I am going to do everybody, I think, a big favor.

15 Thank you very much for this  
16 opportunity today.

17 We go out into the community often,  
18 and we hear all the time concerns about cumulative  
19 health risks. What is it? What about the air?  
20 What about the water? What about the different  
21 sources? What about what I eat and what I breathe?  
22 Et cetera, et cetera.

23 And it is conundrum for scientists.  
24 It is not an easy question. And I'm sure you have  
25 gotten the flavor of that.



1                   I am Ray Werner. I am chief of the  
2 air programs branch. Normally, I'm involved in  
3 implementing the air quality laws. I am not a  
4 research scientist. In fact, Nicky did reach out, I  
5 think to our office of research development and  
6 office of science and policy, to see if they could  
7 get an individual to talk in a very detailed way  
8 about the kinds of risk assessments that we are  
9 considering in headquarters. Unfortunately, they  
10 could not be there.

11                   But I think I could give you a flavor  
12 of what is going on. And I am joined here by Carol  
13 Bellizzi, a colleague of mine who has been here  
14 since this morning listening to these excellent  
15 speakers.

16                   And I want to convince you that EPA  
17 is invested in cumulative health impact studies  
18 because I have seen it in the way I do business and  
19 the way I see everyday changes in how we are going  
20 about looking at science in the areas that I am  
21 involved in.

22                   At the national level there are  
23 cumulative risk technical panels that meet with  
24 NJAC, that meet with communities, that meet with  
25 scientists. I am not going to talk about that in

1 very much detail, but what I am going to do, because  
2 I can't talk about the science in a lot of detail, I  
3 will leave will Willa, or send to Willa Williams a  
4 list of links on EPA's Web site. I am going to  
5 refer to a number of things, and if you are  
6 interested in more detail, through these links, you  
7 will be able to get as much detail, hopefully, as  
8 you would like.

9 I think that could be either put in a  
10 report or made available to the participants so I  
11 don't have to go into much detail.

12 EPA is required to set criteria air  
13 pollutant standards. And there are six criteria  
14 pollutants. And you heard of them. Sulfur dioxide,  
15 particulate matter of various sizes, carbon  
16 monoxide, et cetera. And every five years we review  
17 the health research information. There is a long  
18 process for coming up with new standards.

19 In fact, former Commissioner Jackson  
20 announced that in July of this year we will announce  
21 our decision on a reconsidered ozone standard.

22 So we do look at the health effects  
23 data. What we use is something call ISA. This is  
24 the government. So we have acronyms. Integrated  
25 science assessments. And they are the scientific

1 basis for these air quality standards, which we call  
2 national ambient air quality standards.

3 And the changes that we've noticed,  
4 that I've noticed, is that we are starting to look  
5 at non-chemical stressors, such as socio-economic  
6 status, educational attainment, and reduced access  
7 to healthcare, much more than we have in the past in  
8 reviewing this health information.

9 In December of 2009, EPA released its  
10 ISA, integrated science assessment, for particulate  
11 matter. And in January of 2010, we released an ISA  
12 for carbon monoxide.

13 You can access this on the Web, but  
14 if you want to avail yourself of this information,  
15 you could see the kinds of things we're now looking  
16 at in addition to the just simple health effects.

17 In addition, in March of this year,  
18 EPA announced a power plant mercury and air toxics  
19 rule.

20 The importance of this, I guess, in  
21 terms of cumulative impact is, mercury, which is  
22 probably the primary pollutant that was addressed in  
23 this, in fact, it would require about a 90 percent  
24 reduction, emissions for mercury, is not typically a  
25 problem when you inhale it. It is an ingestion

1 issue. It is particularly important to developing  
2 neurological systems to unborn babies, pregnant  
3 women, because the avenue into the human is not by  
4 breathing, but it is ingestion.

5                   We don't normally think of power  
6 plants as much in urban areas, we probably think  
7 more of cars, trucks and buses and local factories,  
8 and, certainly, they are a factor, but, in fact, the  
9 power plants do get into our air, and they do get  
10 into our water, they go up the food chain, and they  
11 have a number of ways of getting into our body.

12                   So we are not just looking at  
13 inhalation. We are taking actions to look at other  
14 pathways for air toxic compounds.

15                   Other activities and changes I have  
16 seen, we recently released the National Air Toxics  
17 Assessment.

18                   I don't know if you looked at this  
19 information. We'll have the information on the Web  
20 site. But it is very, very cool, I think. You  
21 could go into your street address, your zip code, et  
22 cetera. And we look at 187 passage air pollutants.  
23 We do a cancer and a non-cancer risk estimate for  
24 them.

25                   Now, this is based upon emissions

1 information. Some of it is calculated. Some of it  
2 is measured. Some of it is estimated. We use  
3 models to predict the impact. We use the health  
4 information we have in terms of exposure and hazard.

5 But if you look at that, you go into  
6 your own neighborhood, or some other neighborhood,  
7 you get a pretty good assessment, an estimate, of  
8 what the cancer risk is, where they might come from,  
9 at least the category of sources.

10 And this release that we just made  
11 was based on 2005 emissions information.

12 In the next year or two we are going  
13 to release a revised National Air Toxics Assessment  
14 using 2008 emissions data, but what we're looking  
15 into is something called a national air pollutants  
16 assessment, NAPA, instead of NATA. This is, of  
17 course, the federal government.

18 The difference being is, when you go  
19 into your -- use this tool, which is Google earth  
20 based, go into your location, find your cancer and  
21 non-cancer risk, we're also going to overlay on that  
22 information about the criteria of pollutants. The  
23 carbon monoxide, the particulate matter, the sulfur  
24 oxide. So that a reader can see not only the risks  
25 from hazardous air pollutants, the air toxics, but

1 the criteria groups for which we have health related  
2 standards.

3 So it is an attempt to provide more  
4 information to more communities and locations on  
5 exactly what the state of their health is, and  
6 where, in fact, the pollution comes from.

7 We, actually, set standards for  
8 sources of air toxics. In the business, we call it  
9 the MAC standards. Maximum available control  
10 technology. And, basically, it is a part of the law  
11 where we have identified sources that can emit air  
12 toxics.

13 We have to set a standard.

14 Now, congress at one point developed  
15 the Clean Air Act that had us looking at the health  
16 impacts of all of these hazardous air pollutants,  
17 and we made no progress. We made no progress for  
18 ten or 15 years. And the problem was, there was not  
19 enough health information about all of these  
20 compounds that we could set standards.

21 So in 1990 the law was changed. They  
22 said, never mind. Here are the hazardous air  
23 pollutants. Get rid of 90 percent of emissions.

24 We side stepped the health assessment  
25 part because we didn't know how to do it. So now it

1 is, here you have a refinery, here you have a  
2 smelter, et cetera. Ninety percent reduction if it  
3 is of a certain size and category.

4 But congress also said, you know, go  
5 back after you set those standards, go back later,  
6 and just make sure that the residual risk, whatever  
7 is left coming out of the smoke stack, or emission  
8 point, isn't still a hazard.

9 And so we are in the process of  
10 looking at this residual risk for these standards we  
11 set for sources.

12 And one of the latest developments  
13 is, is that we used to just look at the emissions  
14 from that source for which we set a standard. So we  
15 would go in and we would only look at that one  
16 source behind the chain-link fence. Now in doing  
17 our assessments we are going to be looking at all  
18 the other sources behind that chain-link fence.

19 So when we do our assessment to see,  
20 did we go far enough with our standard, we will  
21 actually be looking at emissions from those other  
22 sources.

23 And that is, again, a shift for more  
24 of a broader look at the air quality impacts on  
25 health.

1                   If you indulge me for a minute,  
2 because I want to get this right, I am going to read  
3 a couple of things, which I know is typically bad  
4 manners for a speaker, but I just want to make sure  
5 I get this right.

6                   There is a cumulative risk screening  
7 tool that is under development. It is called  
8 CFERST. Community focused exposure and risk  
9 screening tool.

10                  And I am going to read from our Web  
11 page. And, again, you can go there and get more.

12                  CFERST brings estimates of  
13 environmental concentrations, human exposure via all  
14 routes, and human health risks, into the same tool  
15 as information about health outcomes, existing health  
16 conditions, demographic, economic, and social  
17 indicators, and sources of stress on the community.  
18 Vulnerability inspectors.

19                  Now, this is now under development  
20 with our office of research and development, it is a  
21 new tool, but it is broader. It starts to look at  
22 some of these other stressors that we know  
23 communities are interested in and we should be  
24 interested in.

25                  Again, I will give you the Web site



1 for that and you can go and find out a lot more  
2 information.

3 We are also evaluating other tools  
4 possibly for use in minority, low income and  
5 indigenous communities that may experience high  
6 burdens from air pollution. Now, it would be a  
7 screening tool. I think it looks even more at the  
8 socio-economic factors.

9 It doesn't exist yet, but it is one  
10 of the things that EPA is evaluating. And I wanted  
11 to bring that to your attention.

12 I just want to close -- one more  
13 thing.

14 Again, I am going to read, and I  
15 apologize for this, because this is typically my  
16 area of focus. I am going to read a press release,  
17 January 11.

18 "EPA awards \$7 million to study  
19 effects of pollution exposure and social stressors  
20 on communities. It's to fund human health risk  
21 assessment research. Scientists around the country  
22 will study a combination of harmful factors  
23 affecting human health. Including research on poor  
24 and underserved communities with extensive pollution  
25 based problems. This groundbreaking research will

1 focus on environments where people are exposed to  
2 multiple stressors, such as chemicals, anxiety, and  
3 poor nutrition. When these stressors are combined,  
4 they can lead to a much higher risk of health  
5 issues."

6                               So this 7 million is not one grant.  
7 It is a number of grants. And I understand, Carol,  
8 one of those is in the New York Metropolitan area,  
9 and I think was awarded to the West Harlem  
10 Environmental Action Group.

11                              If you live or work in the air  
12 pollution community in the New York area, you are  
13 probably familiar with them.

14                              And I will read it, and I apologize  
15 again for reading, but I think it's important, "EPA  
16 studies are generally confined to single chemical  
17 affects. These studies are useful and important,  
18 but can be difficult to apply to the combinations of  
19 chemicals people are exposed to outside the lab.  
20 These types of studies rarely address social and  
21 societal factors that can play a major role. The  
22 STAR grant" -- and this is under the STAR grant,  
23 again, STAR is an acronym for science to achieve  
24 results -- "these STAR grants will research both  
25 societal and environmental factors," including, and

1 there is a whole list of those.

2 I'm probably running short of time,  
3 but I wanted to give you a flavor of some of the  
4 kinds of things where I am noticing EPA looking more  
5 and broader at health effects. And also, again, I  
6 am not a research scientist, but information that I  
7 have gotten from the Web site, or we got from the  
8 Web site, that was prepared by these research  
9 scientists and our office of research and  
10 development. Some of the things going on. And I  
11 think we can look forward to a number of changes in  
12 the future, and, hopefully, that is a direction that  
13 I think most of the communities would like to see us  
14 go.

15 So I will stop there.

16 MR. SHEATS: Thank you.

17 MR. HANNA: Ray, thank you very much.

18 Maybe you don't know, but I will at  
19 least ask the question.

20 Your office of research and  
21 development, where are they in the process? You  
22 mentioned that they have CFERST up and available at  
23 least on the Web site for a look.

24 Is that something that is rolling out  
25 for the states to use, or is that going to be an EPA

1 only tool, do you know, and what is the timing  
2 overall I guess for having a tool like that  
3 available for consumption and for use in other  
4 purposes?

5 MS. BELLIZZI: I don't have any time  
6 line on it. And my information is really from the  
7 Web site and the presentation I found there. But  
8 they are in pilot testing. So they have some  
9 communities, one of them happens to be in our region  
10 in Brooklyn, where my understanding of it is that  
11 these tools have to be populated with the health  
12 outcome information.

13 Apparently, the community had done  
14 some kind of survey. And so, I guess, with EPA's  
15 help, the information was put into the tool, and now  
16 this community, with their New York City Department  
17 of Health, their local Department of Health, they  
18 are going to do some screening.

19 So it is in the pilot testing phase.  
20 And maybe some care communities. Community action  
21 programs for renewed environment, that kind of care,  
22 are going to be using these also. And I don't  
23 really know any detail about that.

24 This tool was developed in response  
25 to care communities' requests for a tool so that

1 they could do risk assessments on their own, risk  
2 screens on their own.

3 MR. WERNER: I think if people had a  
4 particular question we, obviously, won't know all  
5 the answers. If you wanted to share that, write it  
6 down and share it with Carol and myself, how we  
7 could contact you. If we could follow up. If  
8 nothing else, if we could give you a contact name  
9 within the agency to get you that information.

10 MR. HANNA: Just another data point  
11 that's interesting. And that was helpful, Carol.  
12 Thank you. To see that where these pilot studies,  
13 what you're calling them, or grant funded studies  
14 that are happening, in some cases, around the  
15 country, that we heard about today, they all seem to  
16 be in, more or less, that pilot stage still. I am  
17 trying to gage when is the next step beyond that?

18 We may not have an answer.

19 MR. WERNER: I think probably not. I  
20 think, obviously, our attempt is to make this  
21 available to anyone who wants it and who has the  
22 database that can use it.

23 We can try to find out more about the  
24 time frame for that. But our intent is to get this  
25 out as quickly as we.

1 DR. LAUMBACH: I want to make a  
2 comment that we have one of those STAR grants here  
3 in New Jersey.

4 I know that in the past there was  
5 some speculation that the EPA has talked about  
6 cumulative risk assessments. I think for several  
7 years now. But hadn't actually done cumulative risk  
8 assessment.

9 Part of that could be the fact that  
10 EPA thought it wasn't under their purview, the  
11 social sciences, or didn't have the resources to do  
12 that.

13 Is there like an effort to get those  
14 resources, in terms of personnel people, that can  
15 understand better social sciences, could understand  
16 more the impacts on both health as well as  
17 interactions?

18 MR. WERNER: I am sure there is.  
19 Resources are always an issue. EPA I would point out  
20 that, EPA does do cumulative impact studies as part  
21 of its Superfund program. For example, they look at  
22 various compounds and various pathways into the  
23 body.

24 So there are some programs that do  
25 actually use that kind of approach. Air not so

1 much, I think. And that is where the big change is,  
2 and that is what I was referring to.

3 I know that this was one of incoming  
4 administrator's seven priorities, was to look at  
5 community health, and to be transparent, and to  
6 share with the community information we have and the  
7 way that we use it.

8 So I know there is an intent to do  
9 that.

10 Resources, I am sure, is a problem  
11 anywhere.

12 MS. BELLIZZI: There was some big  
13 workshop or something in October, where they brought  
14 together experts and people to work on cumulative  
15 risk. I don't know the name of it. And I don't  
16 know if that was part of the risk assessment forum.  
17 I guess they have a facta under it. A technical  
18 panel. And Ray mentioned the technical panel. And  
19 that is under the risk assessment forum. So I don't  
20 know if all the experts are necessarily in EPA. I  
21 think the facta means they're not in EPA.

22 DR. LAUMBACH: That's a good point.  
23 Thank you.

24 MR. SHEATS: Thank you, Ray.

25 Instead of going to the policy or the

1 efficacy community representatives, we are going to  
2 have a presentation, next up, by Joseph Suchecki,  
3 from the Engine Manufacturers Association, and from  
4 Chicago. And he is going to talk about recent  
5 developments in diesel engines.

6 Thank you from coming from Chicago to  
7 talk to us.

8 MR. SUCHECKI: Thank you very much  
9 for the invitation. I think I came and talked to  
10 the group several years ago at Peg Hanna's  
11 invitation as well and got into a lot of trouble  
12 there because I was saying that diesel wasn't so  
13 bad.

14 But I do want to talk to you today  
15 about a couple of things.

16 First of all, Engine Manufactures  
17 Association is a trade association representing the  
18 major manufacturers of internal combustion engines.  
19 And, basically, pretty much all the diesel engines  
20 that are put in on highway trucks, non-road  
21 equipment, boats, locomotives, stationary sources.  
22 So that we pretty much do all the diesel engines.  
23 We don't represent the auto folks. They have their  
24 own association.

25 Some very brief comments on the



1 topic, which is cumulative impacts of air  
2 pollutants, and then really focus on discussing some  
3 issues with diesel emissions, and provide some of  
4 the latest information on how successful we have  
5 been. It is, actually, a great story.

6 In terms of the cumulative impacts of  
7 air emissions, I think a lot of research, obviously,  
8 is going on, and people are just starting to focus  
9 on that. We know that both EPA and the Health  
10 Effects Institute are really now looking at this  
11 multi pollutant problem.

12 And the Health Effects Institute,  
13 which the auto and truck folks support half and half  
14 with EPA, are really concentrating on this multiple  
15 pollutant analysis. And have done a lot of research  
16 on that. And I think also EPA has redirected a  
17 little bit of stuff there.

18 In terms of, you know, was just  
19 mentioned by your health information person that,  
20 really, if you look at epidemiology studies, they  
21 really are looking at the affects of multi  
22 pollutants because they are really capturing what is  
23 happening out there.

24 Now, the issue is that, the  
25 researchers go in there and try to parse out what

1 pollutant that is from. I think that is a very  
2 difficult job. It is really hard to get that, what  
3 health effect is involved with each individual  
4 pollutant.

5                   For New Jersey, being from the  
6 outside, of course, from Chicago, I would just kind  
7 of leave a question for the Council is, this is such  
8 a big task. I would think that it would be very  
9 difficult for a single state to really look into  
10 that big question. Obviously, there are a lot of  
11 things you could do specifically in New Jersey. But  
12 looking at that whole question of multi pollutant  
13 analysis is really a bigger issue.

14                   So let's talk about diesel emissions.

15                   Your commissioner this morning gave  
16 me a good entrance because a lot of what he talked  
17 about was diesel. It is still a big concern in the  
18 State and across the country. In terms of multi  
19 pollutants, you have to remember that diesel is not  
20 a single pollutant. It is really a mixture of  
21 pollutants. You have all kinds of different stuff  
22 in there, NOX, PM, hazardous air pollutants.

23                   So it really is a mixture. It is a  
24 multi pollutant mixture.

25                   Diesel is really a source. It is not

1 a pollutant. All though people try to classify  
2 that.

3 A couple of other important things.

4 You really can't tell diesel  
5 emissions in the environment. Once it is in the  
6 air, you really can't tell a diesel PM particle from  
7 an auto particle. There is really no unique marker  
8 for diesel exhaust. Certainly, there are some  
9 things, like elemental carbon, that put out more.  
10 But there is no unique marker for diesel PM.

11 There will always be diesel exhaust.  
12 We can't get rid of diesel exhaust. There is always  
13 going to be something coming out of the tail pipe.  
14 What we have done is change the composition of that.

15 I will make the statement here, that  
16 if you look at all the PM research, there is really  
17 nothing in there that indicates that diesel PM is  
18 really any more or less toxic than other PM's in the  
19 environment.

20 And importantly, as I think also was  
21 shown a little bit earlier, along with PM, diesel PM  
22 has been decreasing for about 20 years now. If you  
23 look at any of the work that has been done by the  
24 EPA or the State of California, there is a constant  
25 decrease in the amount of diesel PM in the

1 atmosphere.

2                   So we do know that diesel emissions  
3 contribute to the ambient air pollution. And,  
4 really, that amount, it really varies, depending on  
5 what the sources are. And it also depends on what  
6 method you use. Again, there is no direct marker.  
7 So you can't really tell if you use source  
8 apportionment. And how you do that depends on  
9 whether you have ten percent diesel or 30 percent  
10 diesel. So that is also important.

11                  But the overall approach by the  
12 regulators has been to say, well, there is lot of  
13 questions, but why don't we go ahead and reduce  
14 diesel emissions as much as we can.

15                  That is what we have done. So that  
16 now I will show you it's near zero emissions from  
17 new diesel technology.

18                  This is a slide of the standards for  
19 on highway vehicles. We have gone up from 1994,  
20 kind of the top, the big box, with .1 grams of PM,  
21 and over 6 grams of NOX. And we're now, 2010 was  
22 the first year that we are down to, the very bottom  
23 there, we are down to .01 grams on the standard and  
24 .2 NOX on the standard.

25                  So that is really 99 percent

1 reduction over that time period. And we have done  
2 that also by reducing the sulfur content of the  
3 fuel.

4 I just want to talk about traditional  
5 diesel exhaust, which is pretty much the pre-1998  
6 exhaust, which really had no controls, or very  
7 little controls, up through 2006. And that is  
8 really where all the work has been done on health  
9 effects of diesel exhaust, which is in the past  
10 there.

11 And here is just a list of the  
12 various hazard assessments that have been conducted  
13 by EPA and a lot of other agencies in terms of  
14 diesel exhaust. And, remember, that is a  
15 traditional diesel exhaust.

16 So then we talk about the new stuff,  
17 the new technology diesel exhaust, which is exhaust  
18 from engines using our new technology. And,  
19 essentially, what we are defining that as is  
20 anything after 2007. 2007 the standards came in.  
21 We had to really reduce that PM level. And it is a  
22 fully integrated control system. We have oxidation  
23 catalysts and diesel particulate filters on  
24 everything. And we're also reducing NOX as well.

25 And that applies whether it is a new

1 engine or if you retrofit the engine with the same  
2 technology.

3                   This is just a view -- this is,  
4 essentially, the technology that we are using now  
5 for new diesels. This would be the after treatment  
6 system. You come into an oxidation catalyst, which  
7 helps prepare the exhaust. The exhaust then goes  
8 through this diesel particulate filter, which pretty  
9 much takes care of all the particle. After that, to  
10 control NOX, we have two systems. We are putting a  
11 selected catalytic reduction system on here, which  
12 will reduce the NOX down to that level. And if we  
13 don't use an SCR system, some companies are using an  
14 exhaust gas recirculation, which recirculates and  
15 cools the exhaust entry to reduce that NOX level.  
16 But this particulate filter, the way this works, it  
17 is a catalyzed exhaust filter. So we have the  
18 exhaust. And everything coming in here. The  
19 exhaust goes in. These are closed off out here, so  
20 it forces the exhaust through these porous walls,  
21 and that traps all the particles in there. And then  
22 the exhaust comes out pretty clean.

23                   And then what happens is, we have a  
24 regeneration event, where the particles build up in  
25 there, and depending on the technology, those

1 particles are burned off. So you have, essentially,  
2 complete combustion of those particles, and that  
3 really results in some great reduction.

4 Getting into some of the results now.

5 You have to remember, as I said,  
6 diesel exhaust will always be there. And, actually,  
7 the majority of diesel exhaust has always been water  
8 and CO2. And some NOX in there.

9 This is for traditional diesel  
10 exhaust.

11 And then you have very little amount  
12 of these PM and hydrocarbons and things like that  
13 that really cause some of the problems.

14 So we always had this as being a  
15 little part of the problem.

16 So we had a study that we are doing  
17 with EPA and funded partially by DOE. It is being  
18 run by the Health Effects Institute. And it is  
19 really looking at the emissions and health effects  
20 from new technology diesel exhaust that is ongoing.

21 And we do have the initial results of  
22 that, which we can share with you today.

23 So for the results of the ACES'  
24 testing, which was done down at Southwest Research.  
25 This is the standard, up here, for hydrocarbons that

1 we have to meet by EPA. These diesel particulate  
2 filters are so efficient, we're way down to this  
3 level. It is an order of magnitude lower than the  
4 standard on hydrocarbons. And these FTP and 16 hour  
5 are just different cycles that are used in the ACES'  
6 test.

7                   Again, on PM emissions which is  
8 really the concern with diesel, the standard is .01  
9 up here.

10                   Again, we are actually an order of  
11 magnitude below the standard that we have to meet.  
12 So, again, these filters are just incredibly  
13 efficient. Much more so than they need to be. But  
14 the technology is there. You might as well use it.  
15 So that is what everybody is using.

16                   And then there is also concern about  
17 particle number. There was some indication out in  
18 the community there, that, yeah, we're reducing  
19 particle mass, but the numbers are going up.

20                   Here is a comparison of the ACES'  
21 study with the traditional diesel exhaust particle  
22 numbers. With the new technology. This is a bunch  
23 of different studies here. But particle numbers are  
24 just incredibly lower as well.

25                   More particle number information.



1                   And then the other thing is, well,  
2 there is always an issue about, well, maybe you're  
3 just reducing the level of PM, so you are still  
4 going to have the bad stuff in there, you are just  
5 making it lower.

6                   What I want to point out is that  
7 diesel emissions is now completely different than  
8 what they used to be. The composition is totally  
9 different.

10                  You can see here that in traditional  
11 diesel exhaust, we had lots of PM, and now we are  
12 down really low. But the composition hasn't really  
13 changed.

14                  The elements of black carbon used to  
15 be a very high percentage. With the new technology  
16 diesel, it's a very low percentage. So not only are  
17 we decreasing the actual amount, but the percentage  
18 is less.

19                  So now you can see that diesel  
20 exhaust is very similar to gasoline. It's mostly,  
21 actually, sulfates coming out of the exhaust.

22                  Most of the contaminants that are  
23 found in traditional diesel exhaust, you had a whole  
24 list of about 40 mentioned, they are, essentially,  
25 not found anymore. So in our studies of ACES and

1 other studies we found, we can't even detect a lot  
2 of these compounds that were in there previously.

3 Here is a chart for polycyclic  
4 aromatic hydrocarbons and volatile organic  
5 compounds. Again, you can see the great amount of  
6 decreases with the new exhaust compared with the old  
7 exhaust.

8 So these are numbers, again, from  
9 ACES' study. You can see that for some compounds,  
10 elemental carbon is 99 percent, organic carbon 96  
11 percent reduction, metals 98 percent, furans and  
12 what have you.

13 So, essentially, 80 to 100 percent  
14 reduction in all the bad things that used to be in  
15 diesel exhaust.

16 Here is a couple of slides that just  
17 show you comparisons of various substances with  
18 natural gas engines and gasoline engines. And  
19 you'll see that in all these slides, pretty much  
20 diesel engine exhaust now is on a comparable level  
21 with natural gas engines in terms of what is there.

22 In terms of mass emissions, again, we  
23 are at the same situation, gasoline and natural gas,  
24 the NTDE is actually lower pretty much than a lot of  
25 things now.

1                   The ratio, this is just two different  
2 types of tests of elemental carbon to total carbon  
3 ratio. Again, we're very similar to natural gas and  
4 gasoline.

5                   There has already been a couple of  
6 studies that have looked at toxicity of the new  
7 diesel exhaust. Here is one study that looked at  
8 traditional diesel exhaust and new diesel exhaust  
9 and then filtered air. And you can see what the old  
10 diesel exhaust used to do. This is acute toxicity  
11 in animals. When we get down to the new technology  
12 diesel, it is the, essentially, the same as filtered  
13 air. So we really got rid of all the bad stuff we  
14 think. There is a lot more work to do on that. And  
15 what have you.

16                  There has also been a couple of  
17 reports of human trials. One here that reports  
18 problems with human subjects inhaling regular diesel  
19 exhaust and then new technology diesel exhaust under  
20 controlled conditions. That were undoubtedly  
21 approved by some ethics committee somewhere. I  
22 forgot which. Probably out in California.

23                  What you had, similar solutions of  
24 the new technology diesel. You didn't see those  
25 affects anymore in human subjects.

1                   So what we have is really  
2 fundamentally different type of exhaust now coming  
3 from diesel. The PM levels are a hundred fold less  
4 than what we had before. It's chemically very  
5 different. The composition has totally changed.  
6 You don't have a lot of the air toxics or the  
7 hazards in there that used to be there. And,  
8 essentially, it's similar or even lower than the  
9 emissions you're getting from gasoline or CMG  
10 engines.

11                   And some of the preliminary results  
12 are indicating that in the biological affects tests  
13 in humans and animals, that you're not getting the  
14 same kind of responses that you used to get with  
15 traditional diesel.

16                   And I will say that the ACES' work is  
17 continuing. We had a short-term mouse test that was  
18 done at Loveless, in New Mexico, which is completed,  
19 but HEI is looking at those analysis. That  
20 information, I think some of it will be coming out  
21 at the May HEI meeting as to what the effects are.  
22 Then we have a long-term rat study that's been going  
23 for two years. Trying to look at carcinogenicity in  
24 rats. And that will be done in a couple of years.  
25 That still got a couple years to go.

1                   So it really requires, I think,  
2 people to really look at or relook at diesel  
3 exhaust, since it has really changed today, and it's  
4 here today.

5                   So in terms of what that means for  
6 New Jersey, if we can introduce as many vehicles out  
7 there with the new technology, it's going to reduce  
8 ambient levels of PM's and lessen exposure to multi  
9 pollutants. We really need to recognize that there  
10 is a difference between new technology diesel and  
11 old technology diesel. You have to start thinking  
12 that there's old technology diesel and new  
13 technology diesel. And you have to think about them  
14 really differently, because they are not at all the  
15 same.

16                  One of the things that we like to  
17 say, or think about is, you know, people are still  
18 out there doing a lot of studies on traditional  
19 diesel exhaust. And we, and I think the Health  
20 Effects Institute, are thinking that there is not a  
21 whole lot of value in that anymore. That is the old  
22 technology. It is being replaced. All of the  
23 regulations for all the various sources of diesel,  
24 from the large marine engines, heavy-duty vehicles,  
25 on highway vehicles, off-road vehicles, locomotives,

1 marine, EPA has now issued new regulations that,  
2 essentially, get us down to these levels. Not quite  
3 this low for the big marine vessels because we  
4 simply don't have the technology to put particulate  
5 filters on those huge engines that are about the  
6 size of this room.

7                   Stationary sources, the other folks  
8 at EPA, have issued emission standards for new  
9 stationary engines and also a knee shaft that will  
10 cover existing engines. So it is really in the  
11 works, and we have the technology, it is just a  
12 matter of introducing it.

13                   So in terms of state programs, while  
14 you still have a lot of concern about diesel, the  
15 best thing you could do is to find ways to  
16 transition to the new diesel technology, because  
17 that really improves and very quickly improves the  
18 emissions from diesel and the multi pollutant  
19 environment.

20                   And I think there was a question here  
21 about how long is it going to take at the ports.

22                   Well, I think in the Los Angeles  
23 ports they have actually done some studies because  
24 they have been switching over -- got rid of --  
25 because of their program out at the Los Angeles

1 ports, they started switching over to diesel  
2 already, and folks have been out there measuring  
3 diesel PM. And even in a year there is a  
4 significant difference already in terms of the  
5 pollution that is out there.

6 Just some information for you to  
7 think about as you go forward.

8 Again, thank you for the opportunity.  
9 And I'll be happy to answer any questions.

10 MR. SHEATS: You mentioned one thing.  
11 I was wondering, you said there's no  
12 need to do a study on traditional diesel emissions  
13 because you are going to be switching over.

14 Can you give us a ballpark estimate  
15 of how long it will take -- we know diesel engines  
16 can last a long time -- how long that switch over  
17 will take until you get rid of the traditional  
18 diesel engines?

19 MR. SUCHECKI: All together it's  
20 going to be a long time. And, frankly, the  
21 recession has not helped at all. I mean, from our  
22 point of view as manufacturers, and truck  
23 manufacturers, you know, nobody was buying new  
24 trucks in 2009 and 2010.

25 So in terms of projections, the

1 economic situation really set back when folks are  
2 buying new vehicles.

3                   That is changing now. We are seeing  
4 an upturn in the number of new vehicles being  
5 ordered and sold.

6                   I think I saw some figures on one of  
7 the big national truck carriers where they are  
8 already at 40 percent their fleet is new technology  
9 diesel. Since 2007.

10                   And, again, a lot of people put off  
11 buying new vehicles in the last couple of years, but  
12 that's changing.

13                   It is going to be longer for the  
14 construction equipment, since construction  
15 equipment, traditionally, last a lot longer. Some  
16 of those bulldozers and cranes and stuff just stick  
17 around for a long time.

18                   But, again, whatever you can do to  
19 encourage that.

20                   We have been very supportive of the  
21 diesel emission reduction plan in congress that  
22 helped pay for retrofits.

23                   Unfortunately, that program has been  
24 zeroed out by the president actually, which is a  
25 great concern to a lot of us, but by 2004 that



1 program was canceled out, and I am sure a lot of the  
2 funds are gone.

3 That is what it takes, is money.

4 In California, ARB has taken an  
5 aggressive approach, where they have the ability and  
6 the authority under the Clean Air Act, to have  
7 mandatory retrofits.

8 As the California folks will tell  
9 you, that ran into a buzz saw of concerns because of  
10 the cost of that. And even the ARB has gone back  
11 and revised that. So it is not as an aggressive  
12 schedule. But that is one way that we're looking at  
13 it.

14 It is a number of years, but if you  
15 get the ports to agree to do it, it could be a very  
16 quick turn over time. You know, especially getting  
17 rid of the really old vehicles.

18 MR. SHEATS: Thank you.

19 Next up is Mr. Bruce Groves from  
20 EMILCOTT. He is going to talk about innovative ways  
21 to measure concentrations of pollutants.

22 MR. GROVES: Hi. My name is Bruce  
23 Groves. And I am going to talk a little bit about  
24 from a practitioner standpoint, and not an academic  
25 standpoint, some of our experiences in conducting

1 integrated realtime monitoring of not just air,  
2 various air detection type equipment, but also other  
3 environmental type equipment.

4           The one thing I was going to mention  
5 with Joe is, my experience with diesel equipment is  
6 exactly what you are saying, is that the equipment  
7 today is very clean. And one of the things about  
8 the technologies that we are using, we can see  
9 multiple particle sizes on a lot of these  
10 construction and hazardous waste sites, and we have  
11 shown that the biggest offender are old diesel  
12 trucks in a lot of the work that we are doing.

13           So that has changed the behavior of a  
14 lot of the clients that we work with, which are the  
15 pharmaceutical companies and the chemical companies,  
16 that say that since we have data with such high  
17 levels of PM 1, PM 2.5, in old diesel exhaust, that  
18 they spec out that nothing but clean diesel, low  
19 sulfur fuel, is going to be used. So it changes the  
20 behavior once they start seeing the data.

21           I am going to talk about how do we  
22 improve air quality in high density areas.

23           Where I come from we conducted quite  
24 a bit of integrated air sampling at various  
25 construction sites, various hazardous waste sites.

1 Learned a lot about how to bundle this equipment,  
2 learned a lot about how to use the data, and I think  
3 this is a great application to expand beyond the  
4 source areas that we worked on and look at the whole  
5 issue of urban or high density or air pollution in  
6 general.

7 I think Dr. Fan was talking in one of  
8 her slides about how the pollution source is when  
9 you are dealing on a micro standpoint are much  
10 different than looking at regional air pollution. I  
11 think everyone understands that we got numerous  
12 sources. And when you start looking at realtime  
13 data, you realize that you have many more sources  
14 than you really thought you had in the first place.  
15 They are diverse. All different types. Combustion,  
16 abrasion, just general dust, chemicals. All sorts  
17 of different types of sources out there. They can  
18 be stationary, they can be mobile, episodic. They  
19 come at different times for different lengths of  
20 times. And there is a tremendous effect that we  
21 have seen in trying to bundle meteorologic data,  
22 local meteorologic data, not just the weather that  
23 is being done on a regional basis, to show that  
24 there is a tremendous impact on wind speed direction  
25 and temperature of these various site.

1           The solution from my perspective, and  
2 I have been doing exposure assessments for 25 years,  
3 working with EMILCOTT, and I have conducted samples  
4 in many ways, but the future, clearly, is realtime  
5 data. Realtime data integrated in a platform,  
6 either an agnostic platform, where you have a  
7 neutral platform, where you could have all sorts of  
8 data being fed to show you a lot of different  
9 situations and indicators at the same time.

10           We want to focus on what are the  
11 specific areas. And we're seeing that the detectors  
12 are becoming smaller, cheaper, faster, you have more  
13 types of applications, it becomes less expensive to  
14 put these detectors out there. So we can focus on a  
15 lot of polluted areas, or a lot of different areas  
16 of challenge.

17           And one of the things that is nice  
18 about realtime data is when you have, instead of  
19 studying a lot of this stuff, if you have immediate  
20 action, once you see the data, and once it comes up,  
21 you can take some action. Not just take action to  
22 try to reduce the source, but also to try to observe  
23 what are the actions are being conducted at that  
24 point, so you could determine what future things you  
25 could do to reduce the overall pollution.

1                   Here you see some integrated data  
2 right here. This is a construction site in New York  
3 City. This, actually, was a point source. This is  
4 two-and-a-half micron dust. This is actually an  
5 animated slide showing wind speed. Wind direction,  
6 I should say. You can't quite see the arrows. But  
7 this moves across the site. You can see the  
8 movement over a period of about 15 minutes. And it  
9 identifies various sources, where if you are just  
10 looking at tabular data, you are looking over a  
11 period of time, you just don't see what is happening  
12 at that moment.

13                   One of the things about the system  
14 that we work with and the tools that we work with is  
15 we do focus a lot on sampling for multiple particle  
16 sizes simultaneously. We not only look at  
17 two-and-a-half microns and ten microns, we look at  
18 one, four and look at total dust. You see a lot  
19 when you have multiple detectors on a site. You see  
20 changes in various particle sizes. And that is not  
21 just a threshold that you exceed, but you see a  
22 Delta between 2.5 at certain areas, and you can see  
23 this graphically.

24                   So that gives us an opportunity to  
25 say, "okay, what is going on? Is there a diesel

1 truck that has come on site that doesn't have the  
2 filtration it is supposed to?" It could be a  
3 maintenance issue. Or whatever the issue happens to  
4 be.

5                   We also focused on total volatile  
6 organic compounds, photoionization detection, flame  
7 ionization detection. And part of that is, as part  
8 of the integrated system, we correlate all these  
9 readings with wind speed and direction. So every  
10 sample has a specific location of knowing what  
11 vector that the wind is coming. So the issue when  
12 you are in Camden at the waterfront you will know in  
13 realtime if the wind is coming from Philadelphia, or  
14 if it happens to be coming from Center City Camden,  
15 or whatever point source, then you can track this on  
16 a map to see exactly where the movement happens to  
17 be.

18                   We also include other types of  
19 detection, video, digital imaging. And I'll talk  
20 about some of the other environmental data. And  
21 this is valuable because if you start seeing an  
22 increase in one of your surrogate sampling up here,  
23 this is all automated, and you know it is a certain  
24 wind direction of interest, then you can start  
25 taking pictures. And these pictures being all

1 internet based, you could have an alarm and actually  
2 capture what could be the offending issue at the  
3 time. To gather more and more data. Again, with  
4 the purpose to try to reduce the overall pollution  
5 levels on the site.

6                   The whole other aspect about when you  
7 integrate data and you have all these data points,  
8 we have done a lot of work in the whole human  
9 factors end of how do you get all this data  
10 represented graphically so someone can see it at  
11 that point and make some sense of it?

12                   In this case, this is an iPad. Our  
13 people on site can operate the system and see what  
14 is happening using any internet based Smart Phone,  
15 or Ipad, or whatever.

16                   The issue here of course is creating  
17 safer neighborhoods.

18                   The same technology can be used in  
19 neighborhoods. And I know the Ironbound district  
20 was talked about, with regards to all the different  
21 stressors involved. When you have particulate  
22 vapors and other contaminants.

23                   And we focused again on surrogates.

24                   When we start looking at  
25 particulates, we have the ability to not just alert

1 personnel whatever action can be taken, and possibly  
2 take prompt action to reduce pollutants, or take  
3 prompt action to observe what is happening on site,  
4 so that could help policy, future policy and  
5 gathering data. We also have the ability to start  
6 analytical sampling. And with costs being what they  
7 are, we tie in analytic sampling to realtime data.  
8 So if there is an increase in particulates, we may  
9 start taking samples for metals. If there is an  
10 increase in vapors, we may start take samples, an IS  
11 1501 method, or a TO 17 method, to actually get some  
12 qualitative data to support what we are assuming to  
13 be action levels that are appropriate for the  
14 various surrogate sampling we are taking.

15                   We also integrate data from other  
16 monitoring as part of the integrated systems. Noise  
17 is one. We have a system where noise is part of the  
18 whole process. Where it is not just the noise  
19 levels, but if the noise levels exceed a threshold,  
20 we take a thirty second audio clip. So someone can  
21 say what happened at two in the morning and listen  
22 to the thirty seconds. Because that becomes very  
23 valuable in trying to determine what are the sources  
24 of noise when you start looking at various sites.

25                   Vibration has a lot of interest not



1 necessarily as a stressor, but from an engineering  
2 standpoint, when you are dealing with construction  
3 and things like that.

4                   Temperature, radiation, these are all  
5 realtime.

6                   We have a database -- this is not  
7 realtime data here, but when people are looking at  
8 odor, they can actually put odor into the database  
9 and say, we smelled it at a certain period of time,  
10 and then we can play back and determine what was  
11 happening at that time. Where was the wind coming  
12 from, what were the TOC levels, and so on.

13                   Benefits.

14                   Realtime monitoring, you can identify  
15 in realtime local pollutant sources, look at  
16 contributing conditions.

17                   We had one project where tides were  
18 contributing and there would be a vapor intrusion.  
19 So we could monitor the VOC's and tidal levels.  
20 Again, that is not realtime. We put that in  
21 retrospectively.

22                   You can look at specific contaminants  
23 when thresholds are exceeded.

24                   A big thing for the work that we do  
25 is the return on investment. If you are going to

1 invest in new diesel, for example, it is okay to  
2 say, this is the right thing to do, but if you could  
3 actually measure what is the impact at various  
4 levels, look at the PM 2.5 as an example, show what  
5 it was before, show what it is afterwards, that is a  
6 much better data point than just saying, we know it  
7 is going to be better.

8 We have a single platform.

9 And the last one is, we have a lot of  
10 models out there, a lot of ideas, but when you have  
11 empirical data, this is a wonderful way to test  
12 these models.

13 So I just threw up some policies  
14 here, scientific policies, knowing that this is the  
15 area that you guys are interested in doing. So to  
16 help out a little bit here. You are going to see  
17 radical changes in detector technology. It is  
18 already there. Radical changes in how data is being  
19 handled. I predict you're going to see like  
20 closed-circuit TV's out there in many urban streets.  
21 You can have multiple particle size detectors. And  
22 I think it is a time to really look at some pilot  
23 studies out there, and listening to some of the data  
24 here, some of the studies you are looking at,  
25 sophisticated realtime monitoring, I think, would be

1 perfect to support some of these.

2                   Continue to look at detector  
3 technology. Identify what is out there. That is  
4 something we are doing all the time. Who has got  
5 the neat little gadget and what applicability does  
6 it have in trying to control the local air pollution  
7 and the environmental stressors.

8                   Particle size.

9                   We are getting lots of data in  
10 looking at contaminant transport and predicting  
11 movement, looking at particle sizes between one,  
12 two-and-a-half, four. And I think a lot of work in  
13 the research can be done in trying to use particle  
14 size as a surrogate for a whole bunch of different  
15 types of contaminants.

16                   Legislative policy.

17                   There is a lot of inconsistency out  
18 there with regards to who is doing what in  
19 monitoring when it comes to at least temporary  
20 sites, like construction and hazardous waste sites.  
21 And I think it is good to determine what is out  
22 there and what kind of thresholds would be  
23 appropriate, using some of the surrogate data that  
24 we were talking about earlier.

25                   I think it is a time to also look at

1 current practices and try to get some consistency.  
2 So you don't have one site that has a very  
3 sophisticated system, but you have other sites that  
4 aren't being monitored at all.

5 Thank you.

6 DR. LAUMBACH: I'm curious, very nice  
7 presentation, I'm curious and also impressed with  
8 the technology, but I am curious if you have been at  
9 construction sites that have had old diesel  
10 technology and then those with new, whether you have  
11 data that would indicate the degree to which new  
12 diesel technology at construction sites reduces  
13 community exposures?

14 MR. GROVES: Well, the data that we  
15 have is really particulate matter data. So it  
16 clearly -- not just trucks. I mean, we have  
17 construction equipment, VAC trucks.

18 When you deal with various equipment,  
19 you may have brand new dump trucks coming on, but a  
20 lot of the supporting construction vehicles have  
21 been around for a long time.

22 So we do have that, yes.

23 DR. LAUMBACH: I thought you said  
24 that some of your clients, the pharmaceutical  
25 companies, had required that contractors have clean

1 diesel.

2 MR. GROVES: Right.

3 DR. LAUMBACH: So comparing those to  
4 your clients who don't, I mean, is there anyway to  
5 make a comparison?

6 MR. GROVES: I would say at this  
7 point, I risk saying you could make a comparison  
8 with scientific certainty in a sense, because our  
9 data sets aren't that big. This is part of the  
10 issue with the pilot studies.

11 Anecdotally, absolutely. And, in  
12 fact, even anecdotally, we identify when you have a  
13 problem truck coming on site.

14 MR. SHEATS: Thank you.

15 So now we're coming to the policy  
16 section, law section, folks who have been working  
17 with this for a while and are on the cutting edge of  
18 creating ideas.

19 First up will be Dr. Peter Montague  
20 from the Environmental Research Foundation. Peter  
21 is a nationally-recognized expert on precautionary  
22 principles. Before he supposedly retired last year,  
23 he was famous for writing Rachel's Precautionary  
24 Reporter, which is a weekly newsletter. And now in  
25 his retirement he is currently writing a book on

1 cumulative impacts and helping environmental justice  
2 and the environmental community think through ideas  
3 on this.

4 Thank you, Peter.

5 MR. MONTAGUE: Thank you, Nicky.

6 I want to start talking about the  
7 overall problem of cumulative impacts. It's really  
8 an important problem. I think it is the central  
9 problem that we all face. We are destroying the  
10 biosphere one little bite at a time. And we don't  
11 know how to deal with that. And that is what we are  
12 here to talk about. We are here to talk about the  
13 air part of it, but it is an overall general  
14 problem.

15 For 200 years we have assumed that  
16 the biosphere, the part of the planet that we  
17 inhabit, could tolerate an endless series of small  
18 environmental insults, or harms, that result from  
19 the pursuit of economic growth.

20 This is shown in figure one, where  
21 benefits are growing without limit, which are  
22 accompanied by costs that are growing without limit.

23 This is how our legal system pretends  
24 that the world works.

25 Benefits are going to go on forever,

1 and so long as the benefits outweigh the costs,  
2 costs are going to go on forever.

3                   However, we now know that this view  
4 that the biosphere has limitless capacity to absorb  
5 harm is not supported by science and is false.

6                   So our whole legal system is set up  
7 on a false premise.

8                   Figure two represents the true  
9 situation. As benefits grow without limit, and,  
10 therefore, costs grow without limit, it is  
11 inevitable that we will sooner or later exceed  
12 ecosystem limits. After all, it is a limited  
13 planet.

14                   So here is the reality. As benefits  
15 go up, costs will go up, each one of them benefit  
16 justified in a cost-benefit analysis. But, oops, at  
17 some point you exceed ecosystem limits and you begin  
18 to degrade the whole planet as a place suitable for  
19 human habitation.

20                   We are destroying our only home in  
21 the universe one little bite at a time.

22                   There is abundant evidence that we  
23 have already exceeded at least three ecosystem  
24 limits.

25                   I did prepare a paper. There are

1 some copies over there. There is much more detail  
2 about this in the paper.

3 I can also send it to you by E-mail  
4 if you would like it.

5 CO2 limits have been exceeded in the  
6 atmosphere. The rate of biodiversity loss, we are  
7 between a hundred and a thousand times, causing  
8 extinctions between a hundred and a thousand times  
9 as fast as historical averages. And our  
10 mobilization of phosphorus and reactive nitrogen is  
11 about four times as large as what the biosphere can  
12 tolerate.

13 We are moving about four times as  
14 much fertilizer into the system as the system can  
15 tolerate.

16 Many scientists and many scientific  
17 associations are now revealing ecosystem limits that  
18 we did not previously appreciate. For example, the  
19 Millennium Ecosystem Assessment, published in 2005,  
20 1360 scientists took five years studying 24  
21 ecosystems systems and found that 64 percent of them  
22 are being degraded by humans now.

23 The chief scientist of the World Bank  
24 at the time the Millennium Ecosystem Assessment was  
25 released said, "we are undermining our ecological



1 capital all around the world."

2                   The Board of Directors of the  
3 Millennium Ecosystem Assessment said when they  
4 released the report, "At the heart of this  
5 assessment is a stark warning. Human activity is  
6 putting such strain on the natural functions of the  
7 earth, that the ability of the planet's ecosystems  
8 to sustain future generations can no longer be taken  
9 for granted."

10                   That is a pretty harsh message to be  
11 passed along to our grandchildren. "Sorry, folks,  
12 we used it up. It is not available to you."

13                   But that is what we are doing. That  
14 is really what we are doing. We are using up the  
15 planet, and passing it along to our children and  
16 grandchildren badly degraded.

17                   As we exceed ecosystem limits, we are  
18 running the risk of destroying the biosphere as a  
19 suitable place for humans. We are risking the loss  
20 of our only home in the universe. Which would be an  
21 infinite loss.

22                   There is no amount of benefits that  
23 can compensate for an infinite loss. And so under  
24 these circumstances, cost-benefit analysis ceases to  
25 provide good guidance for future action.

1                   We, therefore, need to change the way  
2 we make decisions. We need to change the over  
3 arching goal of the human enterprise from promoting  
4 economic growth to preserving the integrity of the  
5 biosphere.

6                   I don't mean to minimize the nature  
7 of that change, but that is the change that we need  
8 to make.

9                   It is going to be hard to do. And  
10 either we're going to do it willingly, or nature is  
11 going to impose it on us. And I doubt that nature  
12 is going to be very kind in doing that.

13                  In recent years we have come to rely  
14 on quantitative risk assessment and cost-benefit  
15 analysis for regulating chemicals, but new  
16 information makes it clear that these tools are not  
17 adequate to the task.

18                  Now I am just going to give you some  
19 new information about chemicals that we learned in  
20 the last 15 years that I believe, essentially,  
21 eliminate the utility of doing a risk assessment on  
22 a single chemical. I think it is pretty much a  
23 useless exercise at this point.

24                  Here is some of the new information.  
25 Eight points.

1                   One, endocrine disruption. Many  
2 chemicals can interfere with the hormone system, a  
3 biological signaling system that controls growth,  
4 development, metabolism, tissue function, mood and  
5 behavior. And these hormones kick in within a week  
6 of conception and they are operating until the  
7 moment you die.

8                   Your body is under hormone control.  
9                   So the idea that industrial chemicals  
10 interfere with that, either mimic hormones or  
11 interfere with hormones, is profound new  
12 information.

13                   Some chemicals can disrupt cell  
14 signaling at parts per billion, or even parts per  
15 trillion.

16                   Timing of exposure is critical. The  
17 effects of exposures in the womb, or shortly after  
18 birth, can vary dramatically, depending upon the  
19 exact moment of exposure. A dose makes the poison,  
20 but timing makes the poison.

21                   Think of what this means for doing an  
22 animal experiment. Suppose you dose the animal at  
23 the wrong time in its life, and you don't see what  
24 is going on.

25                   It greatly complicates animal

1 experimentation for toxicological purposes.

2                   Low doses can sometimes be more  
3 biologically disruptive than higher doses. The dose  
4 response curve is sometimes shaped like an inverted  
5 U.

6                   Again, think of what this means for  
7 typical dosing of animals, where you give them the  
8 maximum that you can without killing them, to see  
9 what will happen, on the assumption that the high  
10 dose of the thing is what matters. But if it is  
11 really the low dose that matters. If the high dose  
12 shuts down biological systems, which can no longer  
13 show a reaction, show an effect, but low doses cause  
14 that system to show an effect, it means that our  
15 animal testing at high doses is simply irrelevant.

16                   It's missing a lot of essential  
17 information.

18                   Perinatal exposures near the time of  
19 birth can program a person for life, thus,  
20 determining events that will occur during midlife,  
21 such as cancer or other disease.

22                   This indicates that the delay between  
23 exposure and effect can sometimes be measured in  
24 decades.

25                   How do you take that into

1 consideration in a toxicological study, or a  
2 quantitative risk assessment?

3                   You, basically, don't.

4                   We are exposed constantly to a  
5 mixture of chemical toxicants.

6                   We heard a speaker earlier today talk  
7 about the toxic soup. Well, that is quite right, we  
8 are living in a toxic soup. And the assumption is  
9 of a quantitative risk assessment is that we are  
10 studying the effects of one chemical at a time.

11                   You can never study the effect of one  
12 chemical at a time.

13                   I have a second handout from a DEP  
14 study of 2003 talking about routine toxic exposures  
15 in New Jersey. There is no question that we are  
16 taking a bath in toxic chemicals day in and day out.  
17 So to pretend that we can tease out the effect of a  
18 single chemical, we are kidding ourselves.

19                   We all carry a body burden of  
20 chemicals and chemical mixtures, including in the  
21 endocrine disruptor chemicals. Even if we could now  
22 put ourselves under a Bell jar and keep new  
23 chemicals from coming in, we are already carrying  
24 body burdens of hundreds, if not thousands of  
25 chemicals.

1                   This data is from the CDC in Atlanta.  
2                   So this is a reliable source of information.

3                   It is also evident that another  
4                   premise of our regulatory system is false.

5                   We require pre-market testing of  
6                   pharmaceuticals because we know that humans will be  
7                   exposed to them, but we have exempted industrial  
8                   chemicals from pre-market testing on the assumption  
9                   that people will not be exposed.

10                  We now know because of body burden  
11                  studies that we are exposed. And so that assumption  
12                  is a bad assumption. It is a false assumption.

13                  We now know that people are  
14                  constantly exposed to industrial chemicals. So they  
15                  should be pre-market tested for the same reasons and  
16                  in the same ways that pharmaceuticals are tested.

17                  Seven, mixtures can be biologically  
18                  active.

19                  We now know that mixtures of  
20                  chemicals, each present at insignificant levels, can  
21                  combine to produce biologically significant effects.

22                  Which means that if you really want  
23                  to know about the toxicology, you need to study  
24                  mixtures.

25                  But that hugely complicates your

1 life.

2                   If you had only 200 chemicals that  
3 you were concerned about and you wanted to test them  
4 in mixtures of three, you would have 1.3 million  
5 combinations that you needed to test.

6                   Obviously, the money, the lab  
7 personnel, and the lab space, are not available to  
8 do that for very many chemicals.

9                   So we are really not able to manage  
10 mixtures. Which I think is what this public hearing  
11 is sort of about.

12                  Lastly, the eighth part, new kind of  
13 information about chemicals is epigenetics. It is a  
14 new understanding of ways that harm can be  
15 inherited.

16                  There is much more detail in my  
17 little paper about what this really is, but the long  
18 and the short of it is, the common way of expressing  
19 epigenetics is that you are what your grandmother  
20 ate. That environmental influences on your DNA,  
21 which are not genetic changes as such, they are not  
22 mutagens, but they are alterations of the DNA from  
23 the outside, can be inherited, not only by children,  
24 but by grandchildren.

25                  It puts a wholly new understanding of

1 the meaning of environmental exposures, and the  
2 importance of environmental exposures.

3 So some simple recommendations.

4 In my paper I got like ten pages --  
5 my goal in the paper was to provoke thought about  
6 policy initiatives among members of the Clean Air  
7 Council. So I piled on a menu of options for public  
8 policy changes.

9 I am only going to recommend three  
10 here.

11 Focus not on risk reduction, but on  
12 exposure reduction.

13 We should reduce exposures to the  
14 extent possible. Particularly, protect women, since  
15 we know that these things are readily inherited, and  
16 that harm to the fetus is permanent in that fetus's  
17 lifetime and in, probably, its children's lifetime  
18 too.

19 Secondly, eliminate persistent bio  
20 accumulative chemicals. These are bad actors just  
21 because they stick around. We don't have to do  
22 toxicity testing. We don't have to do hazard  
23 testing. We just have to test whether or not they  
24 hang around in the environment and get into food  
25 chains and work their way to the top.



1                   If they have those characteristics,  
2 they should be eliminated. And that should be a  
3 policy goal.

4                   And based on the excellent screening  
5 tools that we heard about from Steve Anderson and  
6 Rachel Morello-Frosch, once we have identified EJ  
7 communities, overburdened communities, or vulnerable  
8 communities, eliminate emission sources from those  
9 communities. Make that a top public policy goal.

10                  I would be happy to answer any  
11 questions that anyone might have.

12                  Thank you for the opportunity.

13                  MR. SHEATS: Questions from the  
14 Council?

15                  Peter, on your first one, can you  
16 tell me, is there a focus on risk reduction,  
17 exposure reduction? Can you tell me what the  
18 implication of that is? How would we do things  
19 differently, if we do?

20                  MR. MONTAGUE: Well, a lot of people  
21 are doing this in their own lives. They are eating  
22 organic food, for example, if they can afford it, to  
23 eliminate exposure to pesticides. They're not doing  
24 a risk assessment on pesticides. They're not  
25 deciding where to place the decimal point. They are

1 saying, "I have heard enough about pesticides, that  
2 I would like to get them out of my life."

3 And people are drinking bottled water  
4 to try to eliminate water pollution from their  
5 lives. I think it is a mistaken approach,  
6 personally, but that is what people are trying to  
7 do. They are trying to protect themselves against  
8 what they conceive of to be toxic exposures.

9 In communities, you would eliminate  
10 emissions to the extent that you can. You would  
11 reroute diesel traffic, not waiting for the new  
12 diesel engines to kick in over the next 50 years,  
13 but you would get diesel traffic out of communities  
14 to eliminate exposures. You would take sensible  
15 urban planning steps to reduce exposures. Eliminate  
16 sources and move sources away from where people  
17 live. And don't build schools on toxic sites.  
18 Don't cap Superfund sites and brown fields.  
19 Actually eliminate the pollution to eliminate  
20 exposures in the future.

21 From that one statement, focus not on  
22 risk reduction, but on exposure reduction. A whole  
23 series of things fall out as to, will this cause  
24 exposures? Can we eliminate? Let's do it if we  
25 can.

1                   But that is the approach. And once  
2 you accept that approach, it is quite different from  
3 saying, "we are going to rank these things and place  
4 the decimal point here. And then we are going to  
5 scientific peer review it. And then we're going to  
6 have it" -- no.

7                   Let's eliminate exposures.

8                   Fine for the science to go on. I am  
9 all in favor of learning more about toxicology and  
10 the nature of these materials, but we know enough to  
11 act now.

12                  MR. SHEATS: Thank you.

13                  MR. MONTAGUE: Thank you.

14                  MR. SHEATS: Up next, we have Dr. Ana  
15 Baptista.

16                  I am looking to see her official  
17 title in the Ironbound.

18                  It is Director of Environmental and  
19 Planning Projects. And is also the vice-chair of  
20 EJAC. And, in fact, she is a triple threat for us.  
21 She manages things. Manages programs in the  
22 Ironbound. She is a great advocate. As those of  
23 you in DEP will know. But she is also a scholar.  
24 She was the primary author of a report from EJCA,  
25 you will have to talk a little bit about that, about

1 cumulative impacts. And that report, and there was  
2 a public hearing then, was really kind of  
3 responsible for the tool being written, in large  
4 part, and for us being where we are here with this  
5 hearing.

6 Thank you for coming, Doctor.

7 MS. BAPTISTA: My name is Ana  
8 Baptista, and I work in the Ironbound community. I  
9 know it probably seems like the Ironbound is the  
10 most lethal place on the planet, you heard it  
11 mentioned so many times today, but I assure you,  
12 unfortunately, our community is not unique. There  
13 are many communities throughout New Jersey,  
14 generally very dense, urban communities, where a  
15 large portion of minority and low income people  
16 reside very close to industrial sources of  
17 pollution. Multi sources of pollution, mobile and  
18 stationary and other kinds.

19 So I want you to take the lessons  
20 that I present here from Ironbound and really think  
21 about them at the State wide level.

22 That is certainly what we do in the  
23 Ironbound. Although we work very close to the  
24 ground in our community, we spend a lot of time  
25 dedicated to solutions on multiple levels. At

1 state, regional, federal levels, and at the local  
2 municipal level because these issues are complex, so  
3 they require action at multiple levels.

4 Nicky asked me to talk about two  
5 bodies of work that I focused on in particular. One  
6 was the EJAC, we worked with the EJAC, the  
7 Environmental Justice Advisory Council to the DEP,  
8 and some of the cumulative impacts we tried to take  
9 up in the Ironbound in particular.

10 So I will just try to touch on the  
11 highlights of those two. And I would like to really  
12 put it to the Council to think, really, to really be  
13 thoughtful about how we move this agenda forward.  
14 What are the policy recommendations that need to be  
15 put forward to move this? Because we have been  
16 talking about it for a long, long time. And we can  
17 keep talking about it for a long, long time. But  
18 decisions have to be made.

19 So a little bit on EJAC.

20 The Environmental Justice Advisory  
21 Council back in, I guess, in 2008, started to look  
22 at -- really prioritize what are the top issues of  
23 concern for environmental justice communities  
24 throughout the State. And we have representatives  
25 from communities throughout the State on EJAC.

1                   And the number one thing, of course,  
2   that a lot of people identified was cumulative  
3   impacts. You know, time and time again, communities  
4   like Ironbound, Camden, other communities, were  
5   faced with an onslaught of disproportionate burdens,  
6   permitting requests, siting requests at the local  
7   level, state level, for polluting industries. And  
8   communities really felt bombarded. They really felt  
9   like, enough is enough. We have so many pollution  
10   sources already. Can't something be done, or at  
11   least look at to account for and factor in -- factor  
12   already the very heavily burdened.

13                   And so we took on the task of really  
14   researching this issue. I thought we did, actually,  
15   a pretty good job of looking out into the world,  
16   into the country, and seeing what is really on the  
17   cutting edge. What are people doing, not just from  
18   the scientific perspective, but at the policy level,  
19   to address cumulative impacts. And we spoke to  
20   people like Rachel Morello-Frosch, and folks from  
21   the CARB, from Cal/EPA, folks in Massachusetts, and  
22   Connecticut, who were enacting EJ laws, and even  
23   lawyers, about what are some of the legal challenges  
24   or opportunities for moving this agenda forward.

25                   And we looked, of course, at the EPA,

1 who has been talking about this issue for a long  
2 time.

3 Out of all that, after probably nine  
4 months of looking at that, we produced a report in  
5 March 2009, basically, outlining recommendations  
6 specifically to the DEP, but we tried to broaden it  
7 a little bit to multiple agencies within the State  
8 of New Jersey to look at cumulative impacts.

9 They are just summarized here as  
10 bullet points, but the report is still online. I  
11 don't think they have taken it off. I think it is  
12 still there on the DEP Web site.

13 The short and sweet of it is, we need  
14 a way to identify burdened and vulnerable  
15 communities.

16 Some of that you see reflected in the  
17 development of this tool that Steve Anderson  
18 proposed. Starting at the first steps of actually  
19 trying to figure out, what is the tool, what is the  
20 method for identification?

21 We tried the self identification  
22 method. That kind of worked, kind of didn't. I  
23 think at one point DEP had proposed some kind of  
24 really complicated scoring system across the State.

25 There are many different ways to do

1 it, but we said, "just do it."

2                   It is not rocket science. We pretty  
3 much know what the areas of largest impact are. We  
4 know they are going to be along the most urban  
5 corridor of the State, for the most part. We know  
6 where most of the concentration of minority low  
7 income people are. You put those two things  
8 together, and you get a picture that nobody would be  
9 totally shocked to see.

10                   So we said, let's move ahead -- you  
11 know, forward from identifying, to really trying to  
12 adopt recommendations that offer some relief to  
13 these areas that we call hot spot areas, and try to  
14 reduce and eliminate impacts in these communities.

15                   And one of the things we also wanted  
16 to look at, the State to really pay attention to,  
17 was air pollution. And air pollution in the whole  
18 state. So when you reduce PM, for example, in the  
19 whole state, you will have a much larger benefit in  
20 urban areas, EJ communities, where some more of that  
21 is concentrated.

22                   So it is good for everyone, but it is  
23 especially good for EJ communities.

24                   And we went on from there and focused  
25 a little bit on municipalities, and what



1 municipalities could do, what agencies outside the  
2 DEP EPA could do. But I think at the end of the day  
3 we were bias for action. Let's do something. Let's  
4 now wait for everything to be perfected. For the  
5 science to be perfected. We know communities are  
6 under constant assault. They need some attention  
7 brought to this issue. And so, surely, we can put  
8 something forward that would at least get us on that  
9 path.

10                   Since then, since the report, we were  
11 really, I think, one of the first times ever that we  
12 had quite a bit of consensus around DEP and the  
13 Environmental Justice Advisory Council. We really  
14 loved Steve's tool. We thought it held great  
15 promise. It still needs, obviously, to be bedded  
16 more through the department and developed as a GIS  
17 application, hopefully online, and ultimately needs  
18 to be decided how this tool will actually get  
19 implemented in the decision making structures of the  
20 DEP.

21                   And there's lots of different ways  
22 you could go with that. It could be used not just  
23 for permitting, which is, obviously, something the  
24 EJ community would like to see, but as an  
25 enforcement tool, as a tool to focus resources and

1 target things like Green Acres funding, or look at  
2 areas of greater protections.

3                   There hasn't been too much movement  
4 since that 2009 report other than the development of  
5 that tool. And so we are hopeful that more will  
6 come in the future from that report. More of those  
7 recommendations will get implemented.

8                   A little bit about the Ironbound  
9 project.

10                   We also work at the local level, and  
11 we wanted to see if there was a way we could tackle  
12 this issue on a much smaller scale. The Ironbound  
13 community, as I think you heard before, is in the  
14 East Ward, the political ward of Newark called the  
15 East Ward. That is about 50 to 60,000 people. Very  
16 ethnically diverse, Mexican, Latino, Portuguese, and  
17 African-American people living in the community.

18                   We have a great community. It has  
19 wonderful amenities, but it also has lots of  
20 challenges. And to apply for this EPA care grant, I  
21 think it is a level one grant, so level one you get  
22 money to really do a stakeholder process, identify  
23 issues of concern, and prioritize action strategies.  
24 And if you are lucky enough to get to level two, and  
25 if there is any money left in the federal

1 government, you can actually implement some of those  
2 strategies.

3                   So we are at the level one. And we  
4 are coming to the end of that process. And we  
5 started the process off by saying, what we would  
6 really like to do is gather together some of the  
7 community best minds, and best community residents,  
8 really put them in a room together and ask them the  
9 question, what are your top issues of concern?  
10 Looking cumulatively. What you experience day to  
11 day. What you see on the ground? And what are the  
12 actions that will help alleviate those burdens?

13                   And we really wanted privilege bias  
14 fraction and privilege cumulative impacts. We  
15 wanted to look at those issues that eventually had  
16 multiple affects on the community.

17                   A lot of the people in the room here  
18 today are on that stakeholder panel.

19                   Do you want to raise your hands, how  
20 many of you are on that stakeholder panel?

21                   We have some great folks on that  
22 committee. You couldn't imagine the reames and  
23 reames of matrixes we developed with issues that  
24 were identified both by the public and by the folks  
25 in our shareholder group.

1                   We took it out to the public for  
2 public input, and we had a very large cross-section,  
3 you can see, of environmental issues, which we asked  
4 both the public and the stakeholders to rank in  
5 order that they felt was of most importance to them,  
6 their health, their community's health.

7                   The number one issue that both the  
8 community and the stakeholders ranked was air  
9 pollution. And I think the second might have been  
10 quality of life issues, and green space.

11                  And waste related issues.

12                  Those were the top three or four, but  
13 air pollution was by and large the biggest issue  
14 people were really concerned about.

15                  Some of the data we collected, every  
16 bit of data that you could collect at the local  
17 level. And, of course, we found that we had very  
18 big challenges with respect to scale. A lot of the  
19 data, particularly the health data, is at the county  
20 level. A lot of it you can't even get at the  
21 municipal level. So it makes gathering data and  
22 really trying to understand, at the finer scale,  
23 what all the cumulative impacts are difficult, but,  
24 nevertheless, we tried as much as we could to  
25 find -- we found more than 38 waste-related

1 facilities that either treat, handle, or burn waste,  
2 just in the Ironbound, over a hundred brown field  
3 sites, less than four percent of tree coverage,  
4 canopy coverage, in the Ironbound section.

5 The Ironbound section is this right  
6 here.

7 As you can see, we are close to the  
8 ports, and the airport here.

9 And we had a couple of really neat  
10 maps and opportunities to see some stuff that Steve  
11 Anderson, and even Jerry helped put some good data  
12 together for us, on combined sources, to try to get  
13 sort of a finer grade picture of what were some of  
14 the sources of pollution we were dealing with.

15 So this is just a little sampling.  
16 And I don't have the best maps available with me.  
17 Sorry. Hopefully, Steve will get that for us.

18 These are Steve's maps. So I won't  
19 answer too many questions about them, other than to  
20 tell you, they are really cool, and it's really  
21 exciting for the community to get our hands on real  
22 data. And for us, at the finer scale, it is  
23 interested to look at.

24 These are the Turnpike, 1&9, major  
25 routes here, going down this way, and rail lines on

1 the other side, and I78.

2 So this is really the heart of the  
3 presentation.

4 I would like to encourage and urge  
5 this Clean Air Council to really move the DEP to  
6 finalize the model, the cumulative impact model. To  
7 put it into some use in a fashion that the public  
8 could access and use online. And more importantly,  
9 in a manner that the DEP could use in decision  
10 making within the agency.

11 And I would really like to see it,  
12 ultimately, really be used in the regulatory  
13 framework. As a way to screen areas for permitting.  
14 I would like to see it used for resource allocation.  
15 If you have a hot spot area, you get two points in  
16 your Green Acres application. You get, maybe,  
17 targeting enforcement and compliance. And we would  
18 really like to see implementation of strategies  
19 across the State that are just common sense, that  
20 would make good environmental policy for everyone,  
21 but especially for EJ communities. Certainly, PM  
22 2.5 and diesel retrofits are some of the great  
23 policy tools that would help alleviate some of those  
24 burdens at the State wide level, but certainly EJ  
25 communities.

1                   That is it.

2                   I didn't mention too much about the  
3 local planning and zoning, but we are working on  
4 that in Newark. I am also a member of the Newark  
5 Environmental Commission and part of the master plan  
6 technical work group. And we are looking right now  
7 at Newark's master plan, in updating that, and the  
8 zoning. And we are looking at things like buffer  
9 areas. We are looking at things like checklists for  
10 our municipal planning and zoning boards that would  
11 require them to look at proximity to sensitive  
12 populations and sensitive receptors before they  
13 approve redevelopment plans. Looking at potential  
14 ordinances. And we even looked at some California  
15 policies that looked at things like, for example, an  
16 amortization rule that would eliminate grandfathered  
17 industries that are in conflicting land use zones.

18                  So all of those things can help move  
19 it at the local land use and planning approval.

20                  Thanks.

21                  MR. SHEATS: Thank you.

22                  Questions from the Council?

23                  If you could do one thing, Ana, in  
24 the Ironbound to reduce cumulative impact, what  
25 would you do?

1 MS. BAPTISTA: That I could do, or  
2 that I would want somebody else to do?

3 MR. SHEATS: If you could choose one  
4 thing that would be done by you or someone else.  
5 And then on the State level, too, if you could  
6 answer that same question.

7 That is two questions. Sorry.

8 MS. BAPTISTA: You know, what is my  
9 wish list?

10 Honestly, a wish list is, really,  
11 having some regulatory tool to more carefully  
12 consider major new sources and even renewed existing  
13 sources of significant amounts of pollution.

14 And then the second thing is, what do  
15 you do with the mobile sources, which we are very  
16 impacted by with the diesel trucks and the ports and  
17 the airport, which is a much more difficult thing to  
18 do. And to especially do it at a local level.  
19 Because you can do all the truck rerouting in the  
20 world, but you got thousands of trucks in and around  
21 your community, it's hard.

22 One of the things we would like to  
23 see is truck fleets, private. We know we have done  
24 a great thing on the public end, the public fleets.  
25 We would like to see the turn over of large private



1 fleets to newer cleaner trucks and retrofitting of  
2 diesel equipment as much as possible.

3                   At the end of the day, it is like,  
4 you know, what is that tool that will put folks on  
5 the hook when there is a constant onslaught of new  
6 facilities that want to come in, or existing  
7 facilities that are expanding, that pose what we  
8 believe are pollution burdens within the community.  
9 And there is really no tool available in the  
10 community at this point to combat those.

11                   MR. SHEATS: Thank you.

12                   Next up would have been Joanne Held,  
13 recently retired from the DEP and still working on  
14 air pollution issues, but she is sick today. So she  
15 won't be here.

16                   So we'll go right to William "BJ"  
17 Schulte.

18                   BJ is the acting director of the  
19 Eastern Environmental Law Center. BJ and the center  
20 work closely with environmental groups, with the  
21 environmental justice community for years, have  
22 brought a number of significant cases. And BJ is  
23 going to talk to us about one way cumulative impacts  
24 has actually been used already, and that is in NEPA,  
25 the National Environmental Policy Act.

1                   Thanks.

2                   MR. SCHULTE: Thank you for the  
3 opportunity to come in and speak.

4                   Towards the end of my presentation I  
5 had some information about modeling tools and stuff.  
6 As I am sitting here today, I am realizing that a  
7 lot of information has given about that already  
8 today. So I will try to focus more on the beginning  
9 part of it, which is about NEPA, and, basically, how  
10 legislation could help to enact some of these  
11 policies.

12                  So, basically, I am sure most people  
13 are probably familiar, but just as an overview, the  
14 National Environmental Policy Act was signed by  
15 Richard Nixon in 1970. And, basically, NEPA  
16 requires all federal agencies, when they are  
17 undertaking a major action, to include in every  
18 recommendation or proposal for legislation, and  
19 other major federal actions, significantly affecting  
20 the quality of the human environment, a detailed  
21 statement of the environmental impacts on that  
22 action. And that detailed statement is commonly  
23 referred to as the environmental impact statement.

24                  An important thing about NEPA is that  
25 it is a procedural statute and it doesn't contain

1 any substantive requirements, which, in my view, is  
2 one of the limitations of NEPA.

3                   What it means, basically, is that  
4 courts will be reluctant to tell an agency how to do  
5 an impact analysis under the statute. They will  
6 tell an agency that they have to do the analysis,  
7 but they will leave it up to the expertise of the  
8 agency to determine how to do it.

9                   And another part of that is that  
10 there is no action requirement in NEPA other than to  
11 actually perform the analysis.

12                   In other words, there is no  
13 requirement to take a certain action once the agency  
14 has come to a conclusion about the impacts of the  
15 action they are proposing.

16                   But in a nutshell, NEPA's value is  
17 that its aim is to make better and more informed  
18 decisions towards preventing or eliminating damage  
19 to the environment and increased transparency and  
20 public participation.

21                   NEPA requires federal agencies to  
22 consider three types of impacts; direct, indirect  
23 and cumulative impacts.

24                   Direct impacts are caused by the  
25 action incurred at the same time. Indirect, caused

1 by the action later in time, or farther removed in  
2 distance, geographic distance, but is still  
3 foreseeable. And NEPA defines cumulative impacts as  
4 impacts on the environment which result from the  
5 incremental impact of the action when added to other  
6 past, present and reasonably foreseeable future  
7 actions, regardless of what agency or person  
8 undertakes the other actions.

9 I guess two important things about  
10 that definition. It is sort of a mouthful, as most  
11 regulatory definitions are.

12 The first important thing is that,  
13 regardless of what agency or person undertakes the  
14 action that they are examining to do the cumulative  
15 impacts analysis, what this means is that when a  
16 federal agency is doing the analysis, they should  
17 also take into account state actions, local actions,  
18 and not only federal actions, that may also  
19 contribute to the cumulative impacts of the action  
20 that they are proposing.

21 One of the things -- or limitations  
22 with NEPA is that when it was adopted in 1970 the  
23 concept of environmental justice hadn't really been  
24 formed yet. And over the past 41 years that NEPA  
25 has been on the books, it hasn't been amended by

1 congress. It's been tailored by case law, but the  
2 actual statute itself has not been amended at all.

3                   So once the concept of environmental  
4 justice started to come to the forefront, they had  
5 to find ways to fit it in there.

6                   In, I believe, -- I may be  
7 mistaken -- but it's either 1984 or '87 is when the  
8 Council of Environmental Quality issued regulations  
9 under NEPA. And in those regulations they  
10 required -- impacts were defined to include  
11 ecological, aesthetic, historical, cultural,  
12 economic, social, health impacts, whether direct,  
13 indirect or cumulative.

14                   So there you begin to see how  
15 economic, social, health, these types of impacts  
16 were beginning to be incorporated into the NEPA  
17 review process.

18                   Then in '94 we had President Clinton  
19 sign the Executive Order 12898, which directed all  
20 federal agencies to make achieving environmental  
21 justice a central part of its mission.

22                   A couple years after that, the  
23 Council of Environmental Quality issued  
24 Environmental Justice Guidance under NEPA. And then  
25 a year after that the Environmental Protection

1 Agency issued its own guidance for incorporating  
2 environmental justice concerns into the EPA's own  
3 cumulative impact analysis.

4 Subsequent to the signing of that  
5 executive order, we saw the Council of Environmental  
6 Quality and EPA, and many other federal  
7 agencies, agencies I just decided to focus on the  
8 EPA, begin to sort of aggressively find ways to  
9 incorporate environmental justice into its  
10 cumulative impact analysis.

11 Subsequently, under the -- in the  
12 2000's, under the Bush administration, a lot of  
13 these efforts weren't emphasized as much. However,  
14 sort of -- some of the key themes that come out are  
15 the Council of Environmental Quality guidance, and,  
16 also, the EPA guidance, are themes that have come to  
17 surface today in a lot of the talks people have  
18 given.

19 One, first, is identify the effective  
20 population.

21 One of the things that both the  
22 Council of Environmental Quality and the EPA  
23 guidance stressed is the use of non-traditional  
24 methods to identify the population, which would  
25 include reaching out to community-based

1 organizations, municipal health boards,  
2 environmental commissions, because they recognize  
3 that sometimes there may be significant data gaps  
4 when it comes to federal and state level data.

5           Next, identify disproportionately  
6 high and adverse effects; past, present, reasonably  
7 foreseeable future effects; permitted facilities;  
8 proximity to high traffic areas; diesel hot spots;  
9 and, to the extent the information is available, the  
10 reasonably foreseeable future projects. This could  
11 be facilities that have submitted applications for  
12 review or development plans that haven't come to  
13 fruition yet.

14           There is a lot of case law out there  
15 that defines what the scope of those reasonably  
16 foreseeable future effects must include in the  
17 cumulative impacts analysis.

18           And the third theme in these  
19 guidances is public participation. It is a huge  
20 element of performing these cumulative impacts  
21 analysis. And all of the guidances, basically,  
22 state the agencies should aggressively seek to  
23 overcome linguistic, cultural, institutional,  
24 geographic, and other barriers to meaningful  
25 participation, and should incorporate active

1 outreach to the affected groups, both to get  
2 information from them, and to dissimulate  
3 information to them.

4                   So as I said earlier, one of the  
5 limitations to NEPA is that it doesn't contain any  
6 substantive requirements. And another limitation to  
7 NEPA, in my own opinion, is that federal agencies  
8 are only required to do these cumulative impact  
9 analysis when a major federal action is proposed.

10                   So as a result, when you get this  
11 sort of piecemeal analysis, addressing proposals  
12 when they come up, is what often is part of the  
13 cause of the accumulation of negative impacts on  
14 communities. Because when you only do the analysis  
15 when an action is proposed, you don't necessarily  
16 take into account all of the other surrounding  
17 impacts.

18                   And this has definitely been alluded  
19 to by many people, is taking the hot spots approach,  
20 identifying hot spots, and then using that  
21 information for future decision making.  
22 Incorporating it into future decision making.

23                   I'm sure already is familiar with the  
24 concept of hot spots.

25                   Hot spots are where vulnerable and



1 overburdened communities exist together.

2                   Vulnerable populations being those  
3 that are more susceptible to the adverse effects  
4 because of their circumstances, whether it be age  
5 related circumstances, young, or older, or race  
6 related, income, access to health care, access to  
7 healthy sources of food, some of these non-chemical  
8 stressors that were talked about in earlier  
9 presentations. And overburdened populations are  
10 those that are disproportionately subjected to these  
11 multiple stressors.

12                   Determining an overburden population  
13 begs the question of what a lot of regulatory  
14 agencies have struggled with, the geographic scope  
15 of the comparison population that they should use to  
16 determine which populations are overburdened. Which  
17 has also been the subject of a lot of case law.

18                   So once these hot spot areas are  
19 identified, new and modified sources, and other  
20 proposals for actions, should be subject to  
21 additional analysis and scrutiny.

22                   If the cumulative impacts exceed a  
23 certain threshold, additional actions may be taken  
24 to mitigate them.

25                   An example of this could be, last

1 year, when I was here, the Clean Air Council gave a  
2 presentation, suggesting that under the Title V  
3 Clean Air Act Operating Permit Renewal Program, an  
4 agency like the DEP could take into account this  
5 information about vulnerable and overburdened  
6 populations, and combine that with an analysis of  
7 the facility that is up for renewal and an analysis  
8 of the pollution control technology that they have  
9 installed there, and whether that technology is up  
10 to date, and taking a biased action approach and a  
11 precautionary approach. In certain instances, upon  
12 renewal of these permits, it may require these  
13 facilities to install new control technologies to  
14 protect these neighborhoods and communities that  
15 have been identified.

16 My next couple of slides is sort of a  
17 feeble attempt in showing hot spots. A lot of much  
18 better maps have been shown today. But this is just  
19 PM 2.5 non-attainment areas and hospitalization  
20 rates for asthma. And I am not sure, but I am  
21 assuming that the county up on the left is probably  
22 a result of the Port Cement Plant, which is the  
23 subject of a DEP petition for a plant over on the  
24 Pennsylvania side.

25 Could be mistaken about that.

1                   So, basically, at this point, I mean,  
2 the EPA, as I said, they issued the guidance in '99,  
3 or '98 maybe it was, but over the subsequent years  
4 incorporating environmental justice into cumulative  
5 impacts analysis had sort of not been emphasized as  
6 greatly, but now under the current leadership of  
7 Administrator Jackson, it has come back to the  
8 forefront of EPA's priorities. And over the summer,  
9 in July, EPA issued an interim guidance on  
10 incorporating environmental justice into EPA  
11 decision making.

12                   That was just a draft guidance and is  
13 under comment now. So it will be interesting to see  
14 how that is incorporated into current EPA decision  
15 making and how that changes their policies.

16                   So, I guess, sort of the take away  
17 from all of this, is in NEPA the federal government  
18 has a tool to make sure that these environmental  
19 justice issues are taken into account when going  
20 through cumulative impacts analysis. The problem  
21 for New Jersey is, New Jersey agencies aren't bound  
22 by NEPA, and we do not have a NEPA here in the  
23 state.

24                   California has a mini NEPA, called  
25 CEQA, which I think stands for California

1 Environmental Quality Act, but I could be mistaken.

2 I am not sure exactly whether CEQA  
3 has any substantive requirements, but that would be  
4 one thing I would certainly advocate, were New  
5 Jersey to ever enact a statute that was similar to  
6 some form of a mini NEPA, which I know is one of the  
7 recommendations in the EJAC report that Ana  
8 mentioned earlier, but in order to really  
9 aggressively address these issues, a mini NEPA  
10 would, I believe, need a substantive requirement  
11 that would give agencies the authority when they  
12 identify overburdened communities to take actions to  
13 mitigate those cumulative impacts. Which could  
14 include giving them the authority to deny permits on  
15 the basis of their cumulative impacts analysis, or,  
16 like I said before, to require installing improved  
17 up-to-date air pollution control technology on  
18 facilities that are up for renewal.

19 To go back to that a little bit. In  
20 New Jersey we have five municipal solid waste  
21 incinerators. We have Essex, Camden, Gloucester,  
22 Union, and Warren County. Three of those have  
23 baghouse technology on there to control for  
24 particulate matter pollution, which is, according to  
25 DEP, about twice as efficient as electrostatic

1 precipitators. And the only two facilities that  
2 have electrostatic precipitators still are in Essex  
3 and Camden. Which are the red spots on that,  
4 basically.

5                   So I think I will leave it at that.  
6 If anybody has any questions.

7                   MR. SHEATS: Thank you, BJ.

8                   Questions?

9                   You mentioned, and correct me if I am  
10 wrong, but you mentioned possibly requiring a human  
11 interpretation on EJ neighborhoods, overburdened  
12 neighborhoods, the industry to have the best  
13 available technology.

14                   Would that be done under existing  
15 law, or would that take more rule making, or how  
16 would you envision that happening?

17                   MR. SCHULTE: I mean, I think it  
18 could be done under existing law. I am sure there  
19 are lawyers out there that would disagree with me.  
20 But the Federal Clean Air Act, certainly, gives  
21 states that administer their clean air program,  
22 which New Jersey does, the authority to adopt  
23 requirements that are more stringent than the  
24 federal requirements.

25                   So I think that would give New Jersey

1 the authority to do so.

2                   Given the current climate in New  
3 Jersey, I am not sure how likely that is to happen,  
4 but I think the authority is certainly there.

5                   MR. SHEATS: Thank you.

6                   So we are down to the final two  
7 invited speakers. And next to last, that means he  
8 is batting third, so Dave Pringle is batting  
9 cleanup, next to last, batting third, will be Mr.  
10 Henry Rose, who is the Statewide Coordinator for New  
11 Jersey Environmental Justice Alliance.

12                   And Henry is -- he serves two  
13 functions in the alliance. He is a primary  
14 organizer. So Henry is a former labor organizer.  
15 But he is also one of our top thinkers in helping us  
16 think through how to address cumulative impacts with  
17 policy and laws and any other way.

18                   Thanks for coming.

19                   MR. ROSE: Thanks for having me.

20                   And I guess I want to say, first,  
21 that for anybody for the alliance, I am speaking for  
22 Henry Rose at this moment, and not for anybody from  
23 the New Jersey Environmental Justice Alliance. So  
24 that people have some type of plausible deniability  
25 for the things that I am going to say.

1                   And when we look at what is going on  
2 with cumulative impacts and what is going on with  
3 EJ, I think about the inspector general's report on  
4 EJ not being integrated fully in the EPA. That  
5 there's no standards. That there's no guidelines.  
6 That there's no definitions.

7                   New Jersey replicates the same thing.  
8 No standards. No guidelines. No definitions. And  
9 as such, no goals. No objectives. No criterias.

10                  As I am growing older in the world I  
11 have become a more skeptical human being. Probably  
12 since I have been about four. And so I do wonder  
13 whether the lack of guidelines, whether the lack of  
14 standards, is by mistake, or whether it is a kind of  
15 willful neglect.

16                  Now, it may be that after 17 years  
17 EPA isn't capable of coming up with definitions of  
18 who is burdened and who is not. Of what  
19 overburdened means and what it doesn't. Of what hot  
20 spots mean and what they don't.

21                  And, perhaps, New Jersey, after ten,  
22 11 years, since the executive order here, maybe all  
23 of these bright and committed people are incapable  
24 of coming up with standards and guidelines and  
25 criteria.

1                   But I doubt it.

2                   I in truth believe that the reason  
3 that these things are being ducked -- and, first,  
4 let me say how they're being ducked.

5                   They're being ducked by analysis  
6 paralysis.

7                   We need to take a study. We need to  
8 take another study. We need to take a third, forth  
9 and fifth study of the study, of the method, of the  
10 material used.

11                  But this, of course, is Dorothy in Oz  
12 clicking her heels three times, saying, "there is no  
13 place like home" as though somehow or another the  
14 information will end up different.

15                  I remember when Ana introduced the  
16 EJAC report, and I remember asking the question, was  
17 anybody in the room surprised on what was  
18 demonstrated?

19                  Nobody was.

20                  People know where the communities  
21 are. They know what the overburden is. They know  
22 what the problems are. And, for the most part,  
23 where they are emanating from.

24                  This is a moral and ethical  
25 cowardliness. An unwillingness to deal with issues



1 of race and class and power in New Jersey. And so  
2 people duck it.

3 And what we are looking at now is  
4 people ducking these issues as people die.

5 On a regular basis, we know who is  
6 dying. We know who has cancer. We know whose  
7 communities have higher rates of asthma. We know  
8 where high blood pressure is.

9 These are just right at the census  
10 traps. We don't need to look for this anymore.

11 And my fear always with this stuff is  
12 that what we are going to get is more tests, and  
13 more ways to look at the tests, and more ways to ask  
14 the question. Because people are asking the  
15 question because they don't like the answer. Well,  
16 that wasn't the answer we wanted. So let's figure  
17 out how to ask it another way.

18 Unfortunately, we have people, and  
19 particularly DEP, in my mind's eye, that has the  
20 fiduciary duty to protect human health and the  
21 environment. And I don't see it taking place.

22 I am still waiting for one single,  
23 just one, Uno, decision, saying that we are not  
24 going to do this because of environmental justice  
25 reasons.

1                   And, perhaps, afterwards, if somebody  
2 has one -- or tell the truth, somebody could raise  
3 their hand and testify, because I know that there  
4 ain't one.

5                   But one decision, on anything, from  
6 the State that says, you can't do this because of  
7 environmental justice reasons. You can't do this  
8 because this community is already overburdened. You  
9 can't do this because the people here are sick  
10 enough.

11                  And it is this continued  
12 cowardliness, this running away of from race that I  
13 want to say Daniel Patrick Monaghan said to Nixon in  
14 '69, or 68, there is a fatigue. Benign neglect.

15                  At this point the neglect is not  
16 benign. It's far closer to -- I don't want to say  
17 malicious -- but a willful neglect of human health,  
18 human beings. And it is ashame on the State, it's  
19 ashame on the agencies, and it's ashame on the  
20 people who have allowed these things to take place.

21                  I was recently looking at Martin  
22 Luther King, and talking about his letter from the  
23 Birmingham Jail, about how good people by allowing  
24 evil to take place perpetuate.

25                  There is a lot of good people who

1 work in this building, and there is a lot of evil  
2 that continues to be perpetuated.

3 MR. SHEATS: I know you thought about  
4 this. So I feel safe in asking.

5 Give us a regulatory approach, or  
6 legal approach, that you would recommend to reduce  
7 pollution in neighborhoods or to prevent new  
8 pollution from coming into overburdened  
9 neighborhoods.

10 MR. ROSE: I mean, first define what  
11 an overburdened neighborhood is, then look at what  
12 pollutions are already there, and figure out how to  
13 ratchet them down.

14 Is there a specific policy name to  
15 give it?

16 I don't know, but that is three  
17 steps, and it is relatively easily.

18 Here is a problem. Here is an area  
19 that is hot. Here is an area that has a problem.  
20 We are not going to allow anything in that is going  
21 to make it worse. And let's figure out how to put  
22 things in, how to bring things into being to make  
23 things better.

24 And if cumulative impacts take place  
25 by a lot of small incremental steps, then hopefully

1 we can reverse them by small incremental steps going  
2 the other way.

3 But it is going to take somebody  
4 subconsciously stepping in to do that.

5 DR. ALI: My question is, the burden  
6 to the whole state, we know the State, places like  
7 Camden, Harrison, Newark, Trenton, those are the hot  
8 spot areas.

9 If you were the governor, what would  
10 you do for these places to clean up the mess?

11 MR. ROSE: That is almost difficult  
12 for me to conceive of me being the governor, but  
13 having said that, order EPA to do something.

14 What needs to take place? What is  
15 the best science that could take place?

16 You just named Paterson, Trenton,  
17 Camden, Newark, include Elizabeth, Jersey City, and  
18 East Orange, and you have a quarter of the State's  
19 black population that just happens to be poisoned.

20 I guess that is it.

21 DR. ALI: Thank you.

22 MR. SHEATS: Anymore questions?

23 DR. OPIEKUN: From all the tools you  
24 have seen talked about today, what would you think  
25 is ready for prime time to actually move this issue

1 forward?

2 THE WITNESS: Steve Anderson's tool  
3 is great and very close to prime time, but I am sure  
4 that it needs to go through four-years of peer  
5 review.

6 What Rachel Morello, what they are  
7 doing is great.

8 EJ Vu, actually, from EPA, is very  
9 good.

10 But these things are -- no matter  
11 what tool we use, we know where the hot spots are.  
12 And so in some way, in my mind's eye, the tool is  
13 less important than the commitment to activity. And  
14 it is that commitment to act that we have the oral  
15 constipation.

16 MR. SHEATS: Thank you.

17 Where is Dave Pringle?

18 MR. PRINGLE: I am here.

19 MR. SHEATS: I said earlier that the  
20 environmental justice community has been out front  
21 on the issue of cumulative impacts. And that is  
22 true. It's been New Jersey Environmental Justice  
23 Alliance, Environmental Justice Advisory Council,  
24 but there has also been a third group, which is New  
25 Jersey Environmental Federation. Which has been

1 right out there with us, in the league, and one of  
2 the leaders of New Jersey Environmental Federation  
3 is Dave Pringle.

4 MR. PRINGLE: Thanks, Nicky.

5 And I would like to thank the Council  
6 for holding this hearing on this subject and with  
7 this line up. I am honored and humbled to be a part  
8 of it.

9 I would also like to thank all of you  
10 for still being here. I am, actually, pleasantly  
11 surprised that more than half the Council is still  
12 here. It has been here throughout. That is a  
13 credit to you. Not only that you are still here,  
14 but you are all actually looking at me too. So I  
15 think there is some listening going on. And I  
16 promise to make it worth your while. I have a  
17 little different take than -- well, until the last  
18 couple of testifiers it was going to be a very  
19 different take, but I will talk about all the same  
20 themes as you heard from the last couple of  
21 speakers. And I am going to challenge all of you,  
22 and all of us as well.

23 I, actually, like batting cleanup  
24 because as long as people are still listening  
25 because I get to hear what is going on.

1                   The Federation of the Garden State  
2 chapter of clean water action and national  
3 environmental group is one of the few mainstream  
4 environmental groups that does environmental  
5 justice. We truly do prioritize and have full-time  
6 staff dedicated to it. We have a hundred member  
7 groups across the state. Over a hundred thousand  
8 individual members across the state.

9                   I have a biology degree from  
10 Princeton, so I you understand the science. But I  
11 haven't been a scientist for the last 20 years.  
12 It's not my or my group's expertise. You have  
13 currently gotten plenty of that today.

14                  Our role is to turn that science and  
15 data in theory that we heard today into action.  
16 Take that environmental science, unfortunately,  
17 through a political science screen, and get real  
18 world results.

19                  So I would like to sum up in very  
20 laymen's terms what I heard at today's hearing.

21                  We know a lot.cumulative impacts is a  
22 big problem. Too much pollution. Major negative  
23 consequences to our health and the economy.

24                  We don't know enough. And we'll  
25 never know enough. Our collective response to date,

1 recent past and current immediate future plans are  
2 to keep studying things. Take some tentative steps  
3 to reduce or decelerate the trend further.

4 Yes, we might be doing a bit more of  
5 late. And, certainly, I am optimistic with today's  
6 hearing. But we still hear plenty of excuses.

7 This is going to be the only  
8 rhetorical from what I heard today. Particularly  
9 around the diesel expert's testimony.

10 It is a national problem. We don't  
11 have the resources.diesel isn't a problem. It is  
12 trace amounts.

13 I had the same conversation with the  
14 Chemical Engineering Council a couple of weeks ago.  
15 It is the same chemicals that are under your sink.  
16 And I got upset and I said, "Exactly. They are  
17 under your sink. They are not in your tap water."

18 Concentrations don't matter.  
19 Toxicity and biological action is what matters.

20 A couple years ago I testified before  
21 the U.S. Senate Environmental Public Works Committee  
22 on the problem of pharmaceuticals and other similar  
23 chemicals getting increasingly into our waterways.  
24 And the industry will say, "well, it is only the  
25 equivalent of a molecule in the Great Lakes, or in



1 an Olympic swimming pool."

2 Well, that concentration is the  
3 concentrations that make a man a man and a woman a  
4 woman. It is called Testosterone. And how much you  
5 have of it in parts per trillion at a critical  
6 moment in a fetus decides whether you are a man or a  
7 woman physiologically.

8 So parts per trillion and trace  
9 amounts matter.

10 It has been five years since we have  
11 been talking about diesel executive order. Dozens  
12 of New Jerseys have died because of our lack of  
13 action.

14 Yes, I said deaths.

15 Including additional disease and  
16 corresponding economic cost because we haven't  
17 acted. We can't get a simple requirement through  
18 that says state funded justice projects in  
19 environmental communities shouldn't use the dirtiest  
20 equipment when there is cleaner equipment available.

21 We can't get that done.

22 So that is the status quo.

23 Unless and until the science is,  
24 basically, perfect to determine if and how to reduce  
25 cumulative impacts, we're going to err on the side

1 of just studying it some more.

2 DEP estimates that 800 to 1200  
3 premature deaths occur every year from particulate  
4 matter alone.

5 The status quo is a recipe for  
6 disaster.

7 So I challenge all of you, and  
8 myself, to make today a demarcation line and act  
9 now.

10 In 2005, Candidate Corzine committed  
11 to giving DEP the power to just say no to cumulative  
12 impacts. He made it in front of my board during our  
13 endorsement process.

14 Between 2006 and 2009, while he was  
15 governor, he didn't lift a finger to implement that  
16 commitment.

17 In 2009, Candidate Christie said, and  
18 this is a direct quote, "Too many communities bear a  
19 disproportionate share of the pollution burden, as  
20 they do to many others. Too often state decisions  
21 are made without keeping that in mind. I will  
22 require my administration to develop standards and  
23 guidelines and implement them so that cumulative and  
24 disproportionate impacts will carry much greater  
25 weight in out decisions."

1                   Needless to say, we were very  
2 heartened when he said that. I have had numerous  
3 follow-up conversations with various folks in the  
4 administration, including the governor himself, and  
5 while we always like more progress faster, he  
6 already hasn't backed away from that statement the  
7 way Governor Corzine has.

8                   I was further heartened to hear the  
9 Commissioner's statement earlier today here, not  
10 backing away from that, and filling in, in fact, a  
11 bit more detail that we seem to be applying  
12 cumulative impacts in our current decision making.

13                   And where is Henry?

14                   This may or may not be an example  
15 that works for you or not.

16                   Candidate Christie, at the time, and  
17 has repeated since, has cited environmental justice  
18 in opposing something. He opposes the coal plant.

19                   He opposes it. It hasn't been  
20 stopped yet. So I'm not sure if that counts or not.  
21 But I would rather him be opposing it than  
22 supporting it.

23                   It also highlights one of the  
24 problems.

25                   At best, it's questionable whether

1 the State of New Jersey currently has the authority  
2 to stop that plant. It might stop for a number of  
3 different reasons. But I think it is fairly clear  
4 that DEP would be extremely vulnerable to winning a  
5 lawsuit by PurGen if they denied the air permit  
6 today for that plant. Even though that plant  
7 doesn't make any sense for any number of reasons, to  
8 say nothing about environmental reasons.

9                   Going back to that 800 to 1200  
10 premature deaths every year in New Jersey because of  
11 particulates.

12                   That is two to four people dying  
13 every day prematurely and unnecessarily. That is  
14 one Newark resident every week dying. That is a  
15 couple of Toms River and Brick residents dying every  
16 month.

17                   So it is an urban, it is a suburban  
18 problem.

19                   Now we have three proposed new power  
20 plants proposed for the Ironbound in Northern Essex  
21 County. The State legislature just passed a law  
22 subsidizing them hundreds of millions of dollars to  
23 build them. They might not be as bad as coal  
24 plants, but these gas plants, without corresponding  
25 offsets, will add to the pollutant loading, making

1 too many New Jerseyans sick, and, again, leading to  
2 all those premature deaths and the corresponding  
3 increased healthcare costs and lost economic output.

4 That never gets factored into all  
5 these cost benefit analysis.

6 Now we don't know enough, and we  
7 never will, but we do know enough to act now to  
8 reduce these impacts. We can await the perfect  
9 widget, which may or may never come, and fail to get  
10 off the dime.

11 It's just like my dad's last job that  
12 he lost. Brilliant scientist of the best  
13 technology. He was about ten years ahead of  
14 everybody else in developing three-dimensional  
15 imaging through computers. The Department of  
16 Defense loved it because it was early training for  
17 tanks and simulations and all that. Plus, he was a  
18 scientist.

19 He never put the product to market  
20 because he kept, "oh, just one more thing. I can  
21 make it better."

22 He never did 3-D 101 and then 202 and  
23 303. He just kept playing with it. Meanwhile, the  
24 industry caught up and got behind him, dad lost his  
25 job.

1                   So we can keep waiting and dying, or  
2 we can act now.

3                   So I challenge all of us here today,  
4 whether we are working at DEP, a volunteer,  
5 representing industry, environmental justice  
6 activists, frankly, probably most of us probably  
7 wear would consider a couple of those hats, and many  
8 others.

9                   We know what needs to be done. Will  
10 we do it? Will we give DEP, the administration, and  
11 other decision makers, the support to fulfill that  
12 commitment. To stop using the need for study as an  
13 excuse for delay and act now? And as needed, hold  
14 those decision makers accountable.

15                  A year from now, let us be able to  
16 look back at the next Clean Air Council hearing and  
17 see that today was the day we stopped talking and  
18 started acting, and work together so that DEP and  
19 others can start using -- can start ensuring that  
20 cumulative impacts have a greater weight in decision  
21 making.

22                  We need a cumulative impacts policy  
23 in New Jersey to protect everyone, but especially  
24 overburdened environmental justice communities from  
25 pollution.

1                   The policies should affect permitting  
2 of new facilities and allowing existing pollution to  
3 decrease.

4                   Thank you very much.

5                   MR. SHEATS: Questions for  
6 Mr. Pringle?

7                   DR. ALI: In terms of the action  
8 items, what should the Department of the State do in  
9 the next five years to reduce the impact action  
10 items?

11                  MR. PRINGLE: The governor today  
12 should sign an executive order that state funding  
13 will no longer go to any construction project that  
14 isn't using clean diesel, either through retrofits  
15 or clean engines.

16                  The technology is there today.

17                  The World Trade Center, all the  
18 construction going on today at the World Trade  
19 Center, is doing that. That is a massive project.  
20 Rhode Island has that policy. Cook County, Illinois  
21 has that policy.

22                  When we first started talking about  
23 this years ago, it was state of the art. We were  
24 ahead.

25                  We are that brilliant scientist that

1 my dad worked for. We kept playing around with it.  
2 And now we are not even doing it. And everybody is  
3 leaving us behind. Their folks are healthier, ours  
4 are sicker.

5                   There is no reason we can't be  
6 rationing down on permits. The Clean Water Act  
7 actually requires it. Though we don't do it.

8                   CAFRA is one of the few laws that  
9 actually has the words cumulative impact in it.

10                  DEP has never proposed a rule in 20  
11 years. Even though the law gives them the  
12 discretion to use it, they never have.

13                  It is a matter of political will.

14                  DR. ALI: Thank you very much.

15                  MR. SHEATS: Do you have any other  
16 suggestions with respect to incorporating cumulative  
17 impacts into the regulatory process, Dave?

18                  MR. PRINGLE: It's going to be  
19 difficult to define, when does a burden become a  
20 disproportionate burden, or is the accumulation so  
21 great that you are now going to say no, as opposed  
22 to something else.

23                  That is going to be a tough nut to  
24 crack, but we are not doing it.

25                  Let's get into it. Where is the task



1 force?

2 I am one of the leaders of the -- the  
3 critics of the administration, 63 and counting,  
4 stakeholder processes. And I, certainly, don't need  
5 another one.

6 If I had to choose a stakeholder  
7 process that I was going to sink my teeth into, that  
8 one would be it.

9 Let's define what overburden is.  
10 Let's figure out what DEP already has authority to  
11 say no to. What do they need new regulations for.  
12 What do they need new legislation for. And let's  
13 have that fight.

14 Thank you.

15 MR. SHEATS: So all the invited  
16 speakers -- I just want to say, thank you for  
17 everybody who testified. For those of you who came  
18 in the afternoon, even if you felt maybe there was a  
19 sense of weirdness on the part of the Council, your  
20 testimony is important, it is on the record, the  
21 Council will be considering it when we go back to  
22 start writing a report. And we will engage over it.

23 We are to the point now where we have  
24 speakers from the public who want to come say  
25 something.

1                   Let's take a five-minute break.

2                   (Whereupon, a short recess is taken.)

3                   MR. SHEATS: All right. We are going  
4 to finish it off.

5                   Kelly Francis is not here. I do not  
6 see him. So he escaped.

7                   We have Carrie Sargeant from the  
8 Heart of Camden.

9                   MS. SARGEANT: Thank you everybody  
10 who has held in, and thank you for the opportunity  
11 to address you directly.

12                  Since Kelly is not here, and he is  
13 also part of the same waterfront south environmental  
14 network that I am, we will be submitting written  
15 comments to the Council, but we always like to make  
16 sure that we are here as the singled out EJ  
17 community, Camden, to say our minds and speak to you  
18 directly, and be able to answer any questions that  
19 you might have.

20                  The Heart of Camden is a nonprofit  
21 community development corporation based in  
22 waterfront south in Camden. Our community, as well  
23 as the City of Camden as a whole, are exposed to  
24 multiple air pollutants and consequently can be  
25 considered an air pollution hot spot, as you all

1 heard today.

2 In the one square mile that is the  
3 waterfront south neighborhood, relatively high  
4 levels of particulate matter have been discerned and  
5 associated with at least seven toxic metals. This  
6 was ascribed to ten local facilities, but as Dr. Fan  
7 had mentioned, in our one square mile there are 26  
8 permitted facilities.

9 An additional study -- this refers to  
10 her study -- an additional study has identified  
11 diesel emissions as a major source of personal  
12 exposure of the community. Fugitive dust is also a  
13 significant problem.

14 This is all especially important,  
15 considering the race, age, and socioeconomic  
16 condition of the majority of our residents, who can  
17 be defined as a vulnerable subpopulation.

18 It is for our children especially  
19 that I am here to express the need to address  
20 cumulative impact. And to do so sooner rather than  
21 later.

22 And I'll address that in a little  
23 bit.

24 First, I would like to recognize the  
25 current work taking place to address air pollution

1 in our community that has been done collaboratively,  
2 among local nonprofit organizations, our local  
3 industry, the city, county, state and federal  
4 entities. Together we have worked to increase  
5 vegetative cover, retrofit vehicles and equipment,  
6 improve business practices and industrial practices,  
7 educate residents and industries, and even truck  
8 drivers.

9                   However, without integration of  
10 cumulative impact to inform sound policy,  
11 permitting, and regulation, these efforts can and  
12 have been significantly undermine.

13                   The example we would like to give is  
14 the recent permitting of a cement recycling facility  
15 in our neighborhood.

16                   Now, our neighborhood is the EJ  
17 community that rose from putting the wholesome  
18 formerly St. Lawrence cement additive processing  
19 facility into our neighborhood in the first place.  
20 And this past year, February, March of 2010, a  
21 cement recycling facility was permitted to operate  
22 in our neighborhood.

23                   Because the current practice is only  
24 to look at an individual facility and not to  
25 consider the existing facilities in the area, yet

1 another air permitting industry was added to our one  
2 square mile, 1700 resident community.

3 This is unacceptable.

4 And because cumulative impact is not  
5 considered in permitting, only certain undertakings  
6 by that facility are addressed. Their truck traffic  
7 isn't addressed. The condition of their facility is  
8 not addressed. And the surrounding facilities that  
9 are there are not taken into account when their  
10 permit was issued.

11 Consequently, there are an additional  
12 50 trucks a week rumbling around the neighborhood,  
13 and uncovered dusty piles of crushed concrete that  
14 loom over our heads, in addition to what was already  
15 there.

16 And the DEP, since we are in an EJ  
17 community, the DEP notifies us of all permit  
18 modifications.

19 We have reached out and discussed  
20 this lapse with them, and it is being addressed.

21 So we get notified of every permit  
22 modification in our neighborhood.

23 Why were we not notified of a  
24 facility seeking to acquire a new permit?

25 That is a gross oversight.

1                   But if the permitters had to look and  
2 see what was in the community and what was being  
3 added, no matter how small they consider it, they  
4 would see that there is already 26 permitted  
5 facilities within one square mile.

6                   Do we need a study to tell us that  
7 one more is too much?

8                   It is crazy.

9                   So our recommendations, get out your  
10 buzz word bingo for my first one, is to create a  
11 functional urban ecosystem should be a priority, and  
12 carried out through adopting holistic and adaptive  
13 approaches in place of the myopic rigid approaches  
14 currently employed.

15                  If you are looking at our cities and  
16 our inner areas as an ecosystem, the industry is a  
17 part of it. It functions. It has a rhythm. It has  
18 a biological clock. It has inputs and outputs.  
19 Just like everything else. Like a plant, like a  
20 tree, like a person. That is how these things have  
21 to be looked at when you are looking at cumulative  
22 impact.

23                  As Dr. Montague talked about, it is  
24 the biosphere. And everything is working in  
25 conjunction with one another. We can't just look at

1 how much air this one facility is putting out.

2 It has to be contextual.

3 Cumulative impacts, both additive and  
4 synergistic, must be incorporated into the issuing  
5 of permits and permit renewal, development of  
6 regulations and policies. And we should get started  
7 now.

8 I heard Steven do his presentation  
9 how long ago? And the study came out how long ago?  
10 We do need to study. We do need to understand it.  
11 But in some of our situations, we are not fooling  
12 anybody. We know it is a problem. So why can't  
13 some form of control be started now, instead of  
14 waiting?

15 If I was to wait for the personal  
16 exposure study to be revealed to us, in which our  
17 residents walked around for months with vests on to  
18 see what kind of air they were breathing, we would  
19 have been doing nothing for six years.

20 That study was done six years ago.  
21 And the final report has yet to be  
22 issued.

23 And a presentation was made to the  
24 community, saying, "yeah, but you can't go with  
25 anything that we are saying because these aren't the

1 final results."

2                   If the Heart of Camden and local  
3 organizations said, "oh, well, we can't do anything  
4 because we are waiting for the results," we still  
5 wouldn't have a two-and-a-half acre berm shelter  
6 belt, we wouldn't have a gas station that is  
7 becoming rain gardens, we wouldn't have education,  
8 we wouldn't have pamphlets for the truck drivers, we  
9 wouldn't have a good relationship with the industry.

10                   So that is just an example of why we  
11 have to do some things now and then learn as we go.  
12 Adapt.

13                   We would encourage state-of-the-art  
14 technologies and best management practices to be  
15 encouraged and incentivized for all new permits and  
16 permit renewals.

17                   I would like to eliminate all  
18 emission sources from vulnerable communities, as was  
19 said earlier. That is a great start. Let's just do  
20 it.

21                   We need to address on and off road  
22 mobile emission sources.

23                   Overall facility maintenance and  
24 operations need to be addressed.

25                   So it is not just the point sources



1 from these industries, but how are these industries  
2 maintaining their facilities? Are they dusty roads?  
3 Are their sidewalks concaved? Are the trucks idling  
4 outside their facilities?

5 All these little things go into it.  
6 And, again, you have to look at it holistically.  
7 You can't just look at it as a point source.

8 And, of course, you need to consider  
9 the added protections to be afforded to our  
10 vulnerable populations.

11 That is it.

12 Thank you all for the opportunity to  
13 speak to you.

14 MR. SHEATS: What is the status of  
15 the -- you said there was an additional permit about  
16 the Siemens recycling plant.

17 So where are you with that?

18 MS. SARGEANT: It was already issued  
19 in March of 2010. The facility is up and running.  
20 We called the DEP out on it. And they are operating  
21 within their permit.

22 MR. SHEATS: You say notice was not  
23 given about that?

24 MS. SARGEANT: No.

25 You know, there were rumblings, and

1 we were aware that it was going to happen, and I had  
2 given my name to the Solid Waste Advisory Council of  
3 the county, which was supposed to trigger the  
4 actions of the DEP.

5 And I was never notified from SWAC,  
6 who after that permit was issued, they seem to call  
7 me every time they have a meeting. But prior to  
8 that, I hadn't been call.

9 So we missed it.

10 MR. SHEATS: DEP is, basically,  
11 saying, there is nothing that can be done about  
12 that, the permit has been issued?

13 MS. SARGEANT: Correct.

14 MR. SHEATS: Thank you.

15 We have one last speaker, Bill  
16 O'Sullivan, head of the air division in the New  
17 Jersey Department of Environmental Protection.

18 MR. O'SULLIVAN: I'm Bill O'Sullivan.  
19 I am the Director of the Division of Air Quality  
20 here. I just want to thank the Council for another  
21 fine hearing, and Dr. Sheats, for a wonderful  
22 program. Every year I get up here and I say, this  
23 is the best hearing yet. And I got to say it again.  
24 Just a good balance in national experts, state  
25 experts. Very good representation by the

1 environmental community. I am proud of that.

2 I remember it wasn't so long ago,  
3 five years ago, we didn't have the kind of  
4 representation from the environmental and  
5 environmental justice community we have today.

6 So I just wanted to thank the  
7 Council, and recognize Willa Williams, our new  
8 liaison with the council. She is at back. Willa  
9 Williams took over from Sonya Evans, who did this  
10 job for about a decade. Willa is doing a great job.

11 Best council. Best advisory group in  
12 the State.

13 I am bias, but I really believe it.

14 Thank you.

15 MR. SHEATS: So I want to give the  
16 last thanks to all the speakers, and to all the  
17 people who stayed until the bitter end.

18 We will see you next year.

19 Thank you.

20 (Whereupon, the deposition was  
21 concluded at 4:30 p.m.)  
22  
23  
24  
25

## C E R T I F I C A T E

I, RUTHANNE UNGERLEIDER, a Certified Court Reporter and Notary Public of the State of New Jersey, certify that the foregoing is a true and accurate transcript of the stenographic notes of the deposition of said witness who was first duly sworn by me, on the date and place hereinbefore set forth.

I FURTHER CERTIFY that I am neither attorney, nor counsel for, nor related to or employed by, any of the parties to the action in which this deposition was taken, and further that I am not a relative or employee of any attorney or counsel in this case, nor am I financially interested in this case.



RUTHANNE UNGERLEIDER, C.C.R., C.R.R.  
LICENSE NO. XIO1634, XIO0115

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